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Fire Management Proposed Plan Amendment and Environmental Assessment

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Bureau of Land Management

Carson City Field Office
5665 Morgan Mill Road
Carson City, NV 89701
702-885-6100



In Reply Refer to:
1610 (NV-03337)

SEP 22 1997

Dear Reader;

Last spring, we invited you and other interested citizens to help us develop a plan for the management of fire in the Carson City District. The comments we received from organizations and individuals helped us prepare the proposed amendment and alternatives in this document. My thanks to those of you who gave us your comments and suggestions. I hope that you will continue to help us manage your public lands.

The final decision on the amendment will be based on public comments and the analysis in this environmental assessment. We are providing a 45-day period for you to prepare your comments on the proposed amendment and finding of no significant impact. Please send them to this office by November 14, 1997. The address is:

Bureau of Land Management
Carson City Field Office
5665 Morgan Mill Road
Carson City, NV 89701

You are also invited to stop by one of our open house meetings on the amendment. They will be held at the Carson Valley Middle School in Minden on Monday October 27th; at the Fallon Convention Center in Fallon on Tuesday, October 28th; at the Reno Airport Plaza in Reno on Wednesday October 29th; and at the Hawthorne Convention Center in Hawthorne on Thursday, October 30th. You are invited to visit with BLM staff anytime during the open house hours of 4 to 7 PM., and give us your comments in writing on a comment sheet provided at the meeting. You are also welcome to visit the BLM office in Carson City Monday through Friday 7:30 to 5:00 on or before November 14, 1997. Please call Dave Loomis at 702 885-6149 for further information.

Sincerely,

John O. Singlaub
District Manager

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FIRE MANAGEMENT PROPOSED PLAN AMENDMENT AND ENVIRONMENTAL ASSESSMENT

INTRODUCTION

This document describes proposed changes in the management of fire on public lands in the U.S. Bureau of Land Management's (BLM) Carson City District. The changes include increasing the use of prescribed fire and tree thinning to reduce the risk of severe fires and allowing more wildfires to burn out naturally to restore fire as an integral part of the ecosystem. This would be accomplished through assigning fire management categories to all of the public lands in the District. Each category includes specific direction for wildfire suppression and prescribed burning/fuel reduction. The overriding goal of the fire management program would remain protection of life and property.

This document also describes the environmental impacts of the proposed changes as well as those of an alternative action and of continuing current management. It concludes with a draft finding of no significant impact.

PURPOSE AND NEED

The purpose of this proposed amendment to the Lahontan and Walker Resource

Management Plans (RMPs) is to improve fire management direction for the Carson City District. The amendment is needed in order to restore fire as an integral part of ecosystems, improve the diversity of vegetation, and to reduce fire hazard fuels.

Recent large fires all over the West have made it clear that actions must be taken to reverse the trend toward increased size and severity of wildfire. The act of suppressing a fire can lead to an increase in the hazard or threat of an even greater fire in the future, and that is exactly what has happened on a large scale (Brown and Arno, 1991).

The general practice of attempting to exclude fire from ecosystems also has resulted in unintended changes. In fire-adapted ecosystems, plants and animals have all adapted by one means or another to survive and be influenced by frequent fires as well as other environmental factors. Before 1860, more frequent fires prevented the heavy and extensive accumulation of fuels in the environment than in recent times, and therefore fires were generally less severe or damaging to ecosystems (Gruell, 1997). Fires also promoted a greater diversity of vegetation types, ranging from grasslands to shrublands

to forests (Gruell, 1985). That diversity provides stability to the ecosystem by limiting the vulnerability to fire. Without fire as an agent of change, diversity in the landscape decreases, vulnerability to fire increases, and stability decreases. (Weise and Martin, 1994)

It has become more apparent that the attempt to exclude fire indefinitely is ultimately futile. Eventually fuels accumulate to the extreme point that a fire cannot be suppressed by the most effective methods available. The long-term effect is to prolong the time before a fire, to lengthen the interval between fires, and increase the severity of the fires. (Babbitt, 1997)

The Bureau of Land Management is currently identifying direction for how fire will be managed on all public land according to four categories: (a) areas where wildfire is not desired at all; (b) areas where unplanned wildfire is likely to cause negative effects, but these effects can be mitigated or avoided through strategies for managing fire hazard fuels; (c) areas where fire is desired to manage ecosystems, but there are constraints; and (d) areas where fire is desired, and there are no constraints.

The proposed plan amendment is designed to address management of wildland fire in ways that would result in the most beneficial effects and the least damaging impacts to humans and

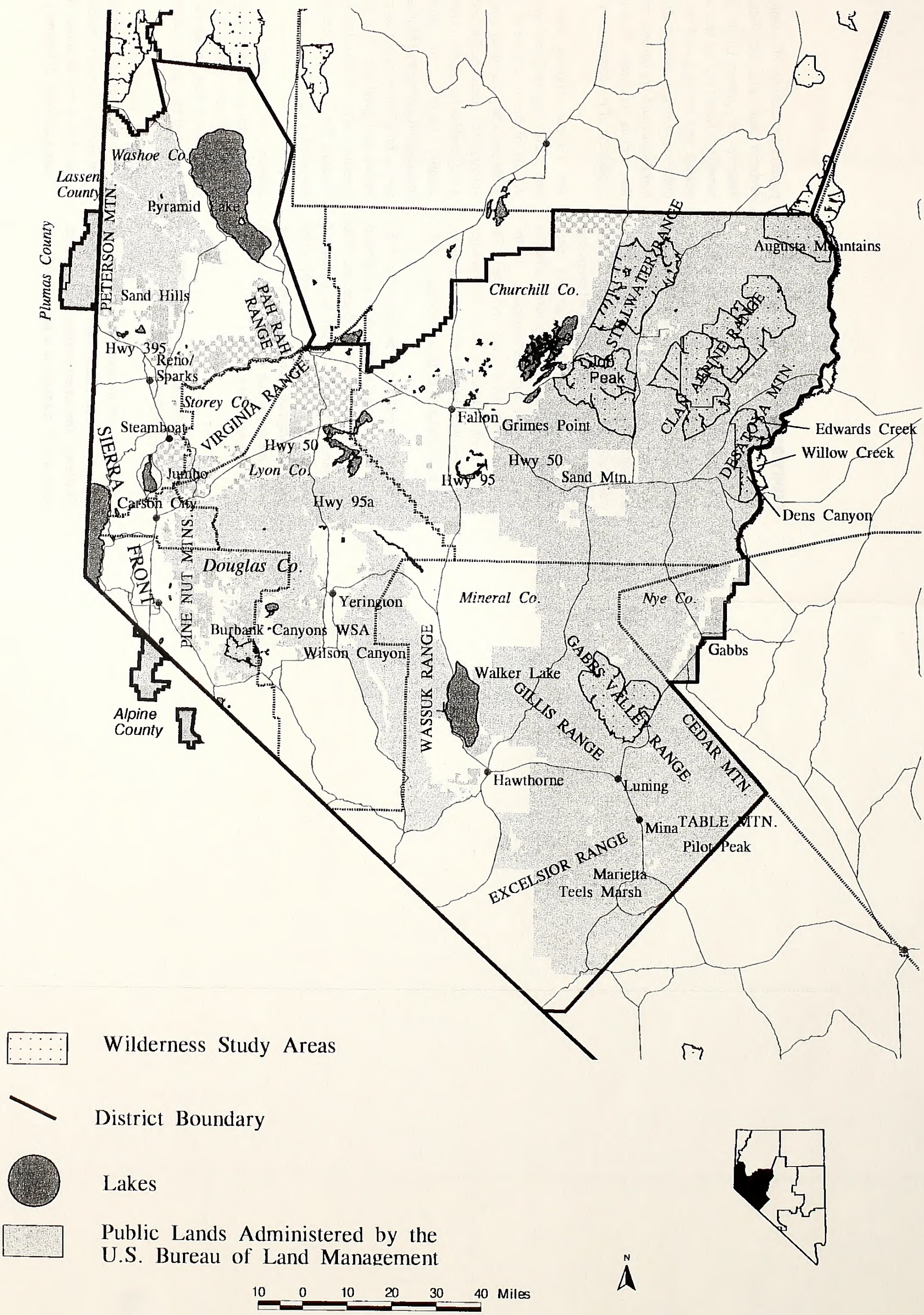
all other aspects of the environment in the Carson City District.

LOCATION

The Carson City District includes about 5 million acres of public land in the Nevada Counties of Churchill, Lyon, Mineral, Washoe, Carson City, Douglas, Nye, and Storey and the California Counties of Lassen, Alpine, and Plumas (Map 1).

Carson City District

Map 1



CONFORMANCE WITH PUBLIC LAND USE PLANS

The District's existing resource management plans emphasize riparian improvement projects such as exclosures, rather than vegetation treatments such as prescribed fire. Consequently a limited area (<20,000 acres) was identified for treatment. Many of these treatment decisions were developed more than 20 years ago and have already been implemented. No fire management strategies were identified for the remainder of the District. Therefore, the proposed fire management direction is not in conformance to the existing resource management plans, and an amendment is the appropriate action.

Fire is an integral part of the ecosystem of the Carson City District and should be an integral part of the District's land use decisions. Fire management direction should be developed and managed on an equal basis with other land use program direction at the resource management planning decision level through this plan amendment.

RELATIONSHIP TO STATUTES, REGULATIONS, OR OTHER PLANS

Public lands are managed under the Federal Land Policy and Management Act of 1976 (FLPMA). The act emphasizes that the public lands will be managed in a manner that will

protect the quality of scenic, ecological, environmental, and archaeological values; preserve and protect public lands in their natural condition; provide feed and habitat for wildlife and livestock and will provide for outdoor recreation. The act also provides for harmonious and coordinated management of the various resources without permanent impairment of the quality of the environment.

The *Federal Wildland Fire Management Policy and Program Review of 1995* calls for the use of fire to achieve ecosystem health while protecting individual components of the environment, human health, and safety. This policy enables managers to take advantage of wildfire incidents to achieve resource management objectives and to allow wildland fire to function, as nearly as possible, in its natural ecological role. The policy provides agencies with expanded opportunities to integrate fire into the management of fire-dependant ecosystems.

Standards and guidelines for livestock grazing on public lands include measures related to fire management, including the following guidelines that were considered in developing the proposed management determinations:

- After a range fire or other natural catastrophic event, vegetation should be returned to the native species as rapidly as possible, to provide forage and habitat for native animals. If a nurse crop is needed

to protect the land from erosion, all native nurse crops should be used first.

- Treated areas will be rested from livestock grazing for two growing seasons or until seedlings are established or the vegetation response has achieved objective levels. Wild horses and burros removed from Herd Management Areas will be restored after rehabilitation objectives have been met.
- Alternative solutions to facilitate fire rehabilitation (such as reseedling, funding, labor, rental equipment use) may be included in cooperative agreements involving qualified groups and individuals who want to participate.

This plan amendment applies only to public lands under the administration of the United States, Bureau of Land Management (BLM). The BLM also provides fire protection for tribal lands within and adjacent to public land until the protection of those lands becomes the responsibility of the independent nations, or by other agreement. The direction of fire management on tribal lands is derived from tribal and Bureau of Indian Affairs policy and planning.

The Toiyabe-Humboldt National Forest maintains protection on the many national forest lands adjacent to public lands administered by the BLM and is undergoing a

two-year process to amend its plans for land use and management, including fire management. Any changes to Forest Service fire management policy and direction would also be coordinated with BLM's public land fire management direction.

Guidance for fire management in wilderness study areas (WSAs) is established in the *Interim Management and Policy for Lands and Wilderness Review*. Fire is viewed as a natural and desirable component of these areas. Fire management will rely on the most effective methods that are least damaging to wilderness values. The use of dozers, heavy equipment, and other surface-disturbing tactics is limited to the protection of life and private property. In January, 1997, a revised *Wilderness Interim Fire Management Plan* was adopted for the Carson City District, which provides additional direction for fire management in WSAs. Fires in the eastern, more remote WSAs will accordingly be monitored and allowed to burn to a moderate or large size.

Guidance for emergency fire rehabilitation (EFR) is found in Section 1742 of the BLM Manual. For all alternatives addressed in this assessment, EFR measures would be applied after each fire appropriate to the need to prevent accelerated soil erosion and establishment of noxious weeds. Fireline rehabilitation through restoration of surface

contours and closure to vehicles would be the norm.

This environmental assessment is tiered to the Lahontan and Walker Resource Management Plan Environmental Impact Statements (EISs, 1986), which include relevant planning criteria and analyze general resource direction for the public lands in the Carson City District. It is also tiered to the Vegetation Treatment on BLM Lands in Thirteen Western States EIS, which analyzes the general impacts of prescribed burning and manual fuels treatments on public lands.

PROPOSED AMENDMENT AND ALTERNATIVES

INTRODUCTION

The proposed amendment, one action alternative and a continuation of current management alternative have been developed for this analysis. These represent a reasonable range of management opportunities for fire on public lands in the Carson City District. Chart One summarizes land management categories by acreage for each alternative. Table One presents a summary comparison of impacts by alternative.

Several plan amendment determinations, including categories of fire management direction are common to both action alternatives. These are:

- **Category A** -- Those areas where wildfire is not wanted. These areas may include threatened and endangered species habitat and the urban/wildland interface. Full suppression of wildfires would be the objective. Treatments using prescribed fire and selective tree cutting could be used on a limited basis to reduce fuel loading and the potential for severe wildfires.

Wildfires in Category A areas would be suppressed with the intent of holding

them to 10 acres or less 90% of the time, and continue aggressive suppression until fires are contained.

- **Category B** -- Those areas where wildfire is not wanted, but if fires occur and escape, management options on how to suppress the fire are available. It is recognized that fire has a role in the natural environment, and opportunities for prescribed fire are significant. Many of the areas in this category have a history of severe fires that have escaped, despite aggressive full suppression responses. Hazardous fuels would be reduced in order to reduce the threat of rapid fire spread and escaped fires. Techniques to accomplish this would include prescribed burning and selective tree cutting. Major considerations are wildland/urban interface; threatened, endangered, or sensitive species habitat, or areas that have experienced so much fire in the last 10 to 15 years that special consideration is warranted.

Wildfires in Category B areas would be suppressed with the intent of holding 90% to 10 acres or less in forested areas, and to 25 acres or less in brush or grass areas. Escaped fires would be closely analyzed to consider protection of life, then property and natural resources, and suppression strategies that would most

effectively meet these goals would be used.

- **Category C** -- Those areas where fire has a significant role in the environment, and wildfire should be used to accomplish resource management goals. Constraints exist, but are generally localized (small towns, ranches, riparian sites, etc.), and would require buffer zones of full protection and fuels treatments, but as a whole, the areas are delineated for the beneficial effects of fire.

In this category, the need for prescribed fire is less and tends to be site-specific to accomplish protection or improvement goals. The desired future condition is a healthy ecosystem characterized by a good distribution and proportion of successional stages such as would occur over time under a natural fire regime. The desired outcome is that fires would be irregular in shape, exhibit varied intensities, and not consume more than half of any major drainage.

The objective for Category C would be to contain unplanned ignitions to less than 2000 acres 90% of the time in all vegetative types. Fire suppression tactics would be constrained to protect scenic, natural resource, and wilderness values.

- **Category D** -- Those areas where wildfire should be allowed to burn in a mostly unrestricted fashion to achieve resource objectives. All fires receive a response and would be evaluated for potential threats or negative impacts. Fire control actions would be limited to protection of small sites with constraints (such as ranches, improvements, or riparian zones) by either applying preventative fuels management treatments before wildfires start or by herding wildfires around in a manner that would achieve resource objectives. Opportunities for prescribed fire or selective tree cutting are usually localized in nature, either to protect, enhance, or restore specific values in particular areas.

Wildfires in Category D would have no specific acreage limitation. Fires would be contained by appropriate means where and when conditions would result in significant damage to natural resources or threaten private developments.

- Under all the fire management alternatives considered, the concept of minimum impact suppression tactics would apply, whereby the environmental impacts of emergency fire management methods used would be no greater than necessary to meet fire management objectives.

- Prescribed burns would be reseeded, using native species to the extent practical, wherever residual vegetation is not adequately abundant to revegetate the sites naturally, prevent domination by invasive weed species, and meet ecosystem restoration objectives.
- Increased emphasis would be placed on natural resource objectives for each fire and fuels treatment. A monitoring and evaluation program would be established to determine the effectiveness of the management implemented. This would include the purposeful collection and analysis of data to determine the results of implementing management actions. It would require monitoring both pre- and post-fire environmental conditions. This information would be used to adjust management determinations. Adjustments in fire and fuels management practices based on sound scientific monitoring and analysis would be consistent with this plan amendment.
- Regardless of the alternative selected, current standard operating procedures for environmental analysis would be followed. Each proposal for a prescribed burn or selective tree cutting would be further analyzed in a project-specific environmental analysis.
- The assignment of one or more resource advisors would be a standard practice for all intermediate and large wildfires and for all wildfires regardless of size in Categories C and D.

Chart One: Acreage of Management Prescriptions by Alternative

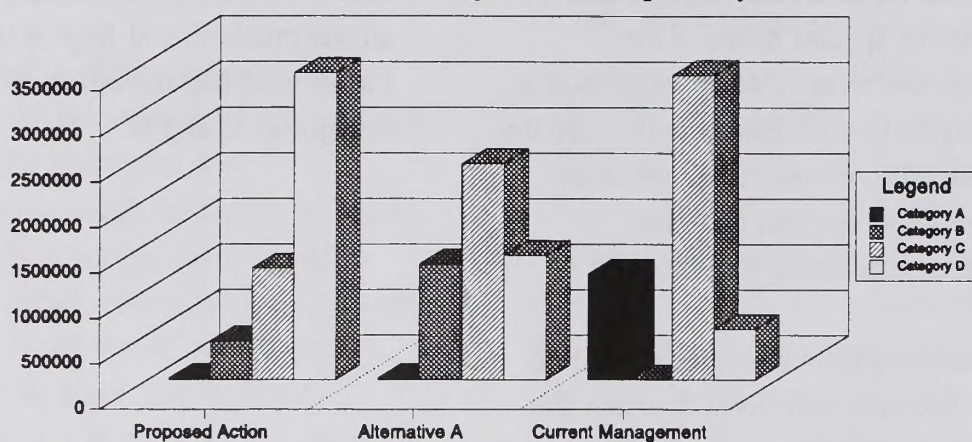


Table One: Summary Comparison of Environmental Consequences

Resource	Proposed Action		Alternative A		Current Management	
	Short Term	Long Term	Short Term	Long Term	Short Term	Long Term
Fire Frequency	0	++	0	+	0	-
Water	-	+	-	+	-	0
Air Quality	-	+	-	+	+	-
Soils	0	+	-	+	-	-
Vegetation	+	++	+	+	0	-
Wildlife	0	++	0	+	0	-
Wild Horses	+	+	+	+	0	+
Livestock grazing	-	+	-/+	+	-	+
Forest Resources	-/+	++	-/+	-/+	-	-
Recreation	--	+	-	+	0/-	-
Realty	-	+	-	+	-	-
Wilderness	-/+	+	-/+	-/+	0/-	-/+
Cultural/Religious	0/-	+	-	+	-	-
Visual Resources	--	0/+	-	+	-/+	-/+
Social Economics	--	+	-	+	-	-

0 = neutral, - = negative, + = positive

PROPOSED AMENDMENT

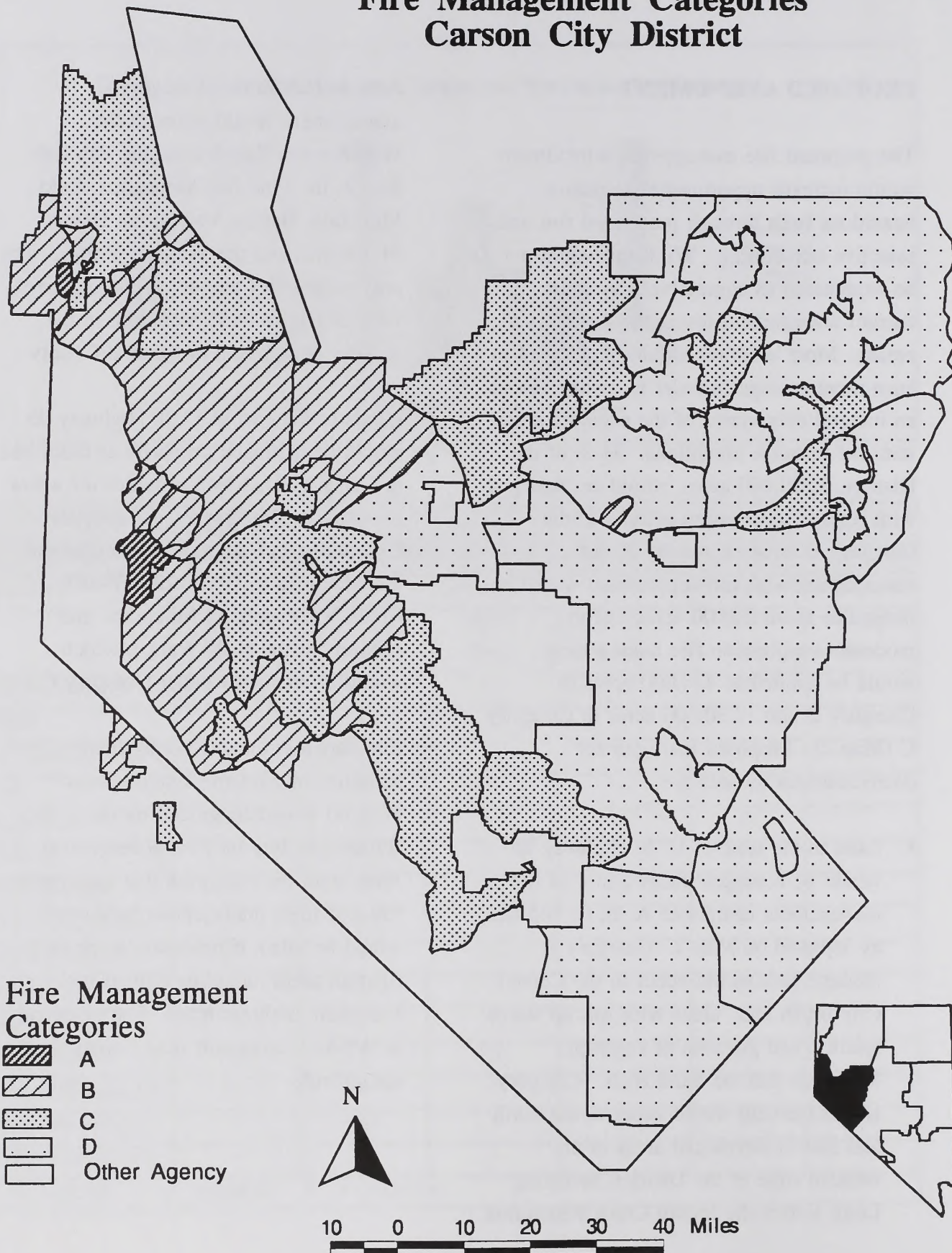
The proposed fire management amendment would increase opportunities to reduce hazardous fuels through prescribed fire and selective tree cutting. Wildfires would not be suppressed as aggressively as under current management (except in Category A areas). More wildfires would be allowed to burn more acreage in order to restore fire as an integral component of the ecosystem and improve resource conditions. Most of the District, 3,370,000 acres, would be managed with limited suppression activity at the Category D level. Category A fire management with full suppression would be limited to about 20,000 acres. More moderate suppression fire management would be applied to 430,000 acres in Category B and 1,230,000 acres in Category C (Map 2). Proposed management determinations by area are:

- Land to the west of U. S. Highway 95 would be managed under a mix of fire management categories A, B, C, and D, as depicted on Map 2. Category A management would occur in the Carson City urban area, areas with special status species, and portions of Petersen Mountain and the Sand Hills. Category B management would occur to the north and east of developed areas in the western edge of the District, including Long Valley the Indian Creek Recreation

Area in California. Category C management would occur in the Winnemucca Ranch area, the Pah Rah Range, the Pine Nut Mountains, Bald Mountain, Bagley Valley, the Desert Mountains, and the Wassuk Range. The only area with Category D management west of Highway 95 would be in the vicinity of Marietta in Mineral County.

- Lands to the east of U. S. Highway 95 would be managed primarily as described in Category D, which provides for a low intensity of fire suppression activities. Exceptions to Category D management include areas in Dixie and Edwards Creek Valleys, Sand Mountain, and portions of the Gillis Range, which would be managed under Category C.
- Fire suppression and management activities in wilderness study areas (WSAs) would be guided by the *Wilderness Interim Fire Management Plan*, with the exception that appropriate fire and fuels management measures would be taken if necessary to protect riparian areas including habitat for Lahontan cutthroat trout. The objective in WSAs is to permit fires to play their natural role.

Proposed Action Fire Management Categories Carson City District



ALTERNATIVE A

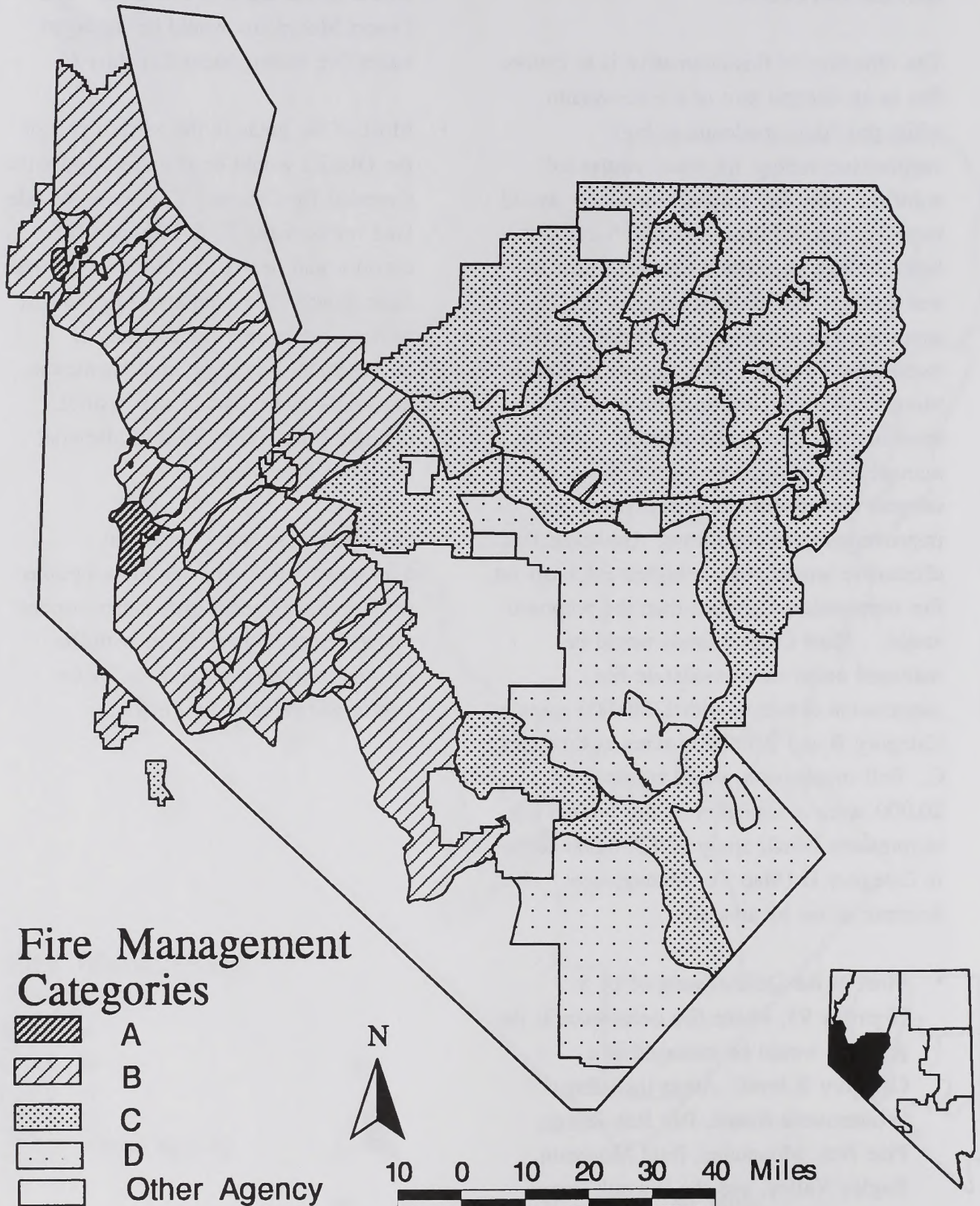
The objective of this alternative is to restore fire as an integral part of the ecosystem while providing moderate to high suppression actions for many unplanned wildfire. Like the proposed action, it would increase opportunities to reduce hazardous fuels through prescribed fire and selective tree cutting. Wildfires would not be suppressed as aggressively as under current management (except for Category A areas). More wildfires would be allowed to burn more acreage than under current management in order to restore fire as an integral component of the ecosystem and improve resource conditions. However, this alternative would place a higher emphasis on fire suppression activities than the proposed action. Most District lands would be managed under more moderate fire suppression direction with 1,280,000 acres in Category B and 2,380,000 acres in Category C. Full suppression would continue on 20,000 acres in Category A and limited fire suppression would apply to 1,370,000 acres in Category D (Map 3). Management determinations by area are:

- Most of the District west of U. S. Highway 95, where fire occurrence is the greatest, would be managed at a Category B level. Areas including Winnemucca Ranch, Pah Rah Range, Pine Nut Mountains, Bald Mountain, Bagley Valley, and the Wassuk Range

would be managed at this level. The Desert Mountains would be managed under fire management Category C.

- Most of the areas in the eastern part of the District would be managed under the direction for Category C. These include land north of the U. S. Highway 50 corridor and near U. S. Highway 95 and State Route 23, which are major tourist routes. Large areas of category D management would be implemented in the southeastern part of the District, including the Gabbs Valley, Marietta, and Pilot Mountains areas.
- For wilderness study areas, this alternative would provide more options for fire management than under current management in accordance with the *Interim Management and Policy for Lands and Wilderness Review*.

Alternative A Fire Management Categories Carson City District



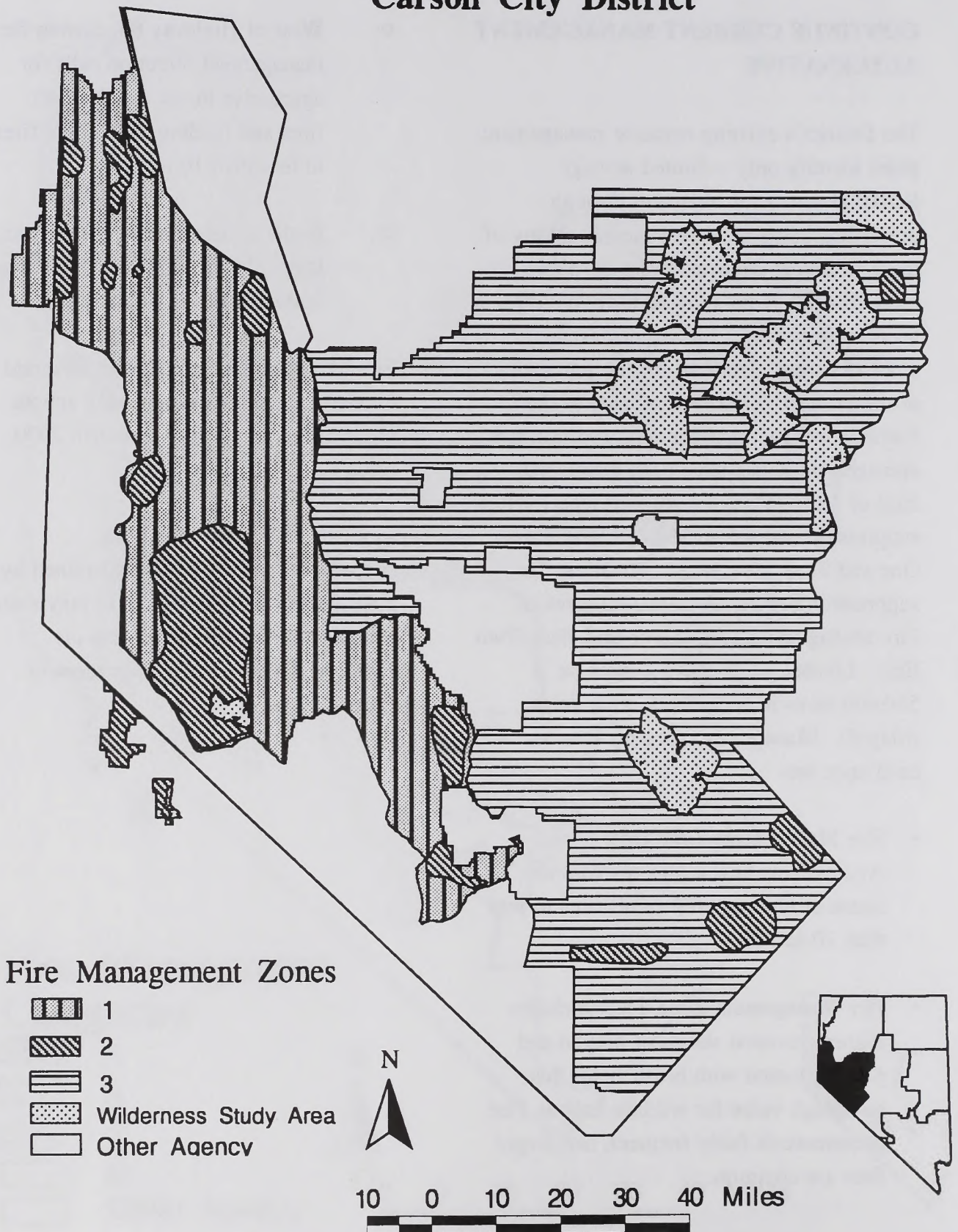
CONTINUE CURRENT MANAGEMENT ALTERNATIVE

The District's existing resource management plans identify only a limited acreage (<20,000 acres) for treatment through prescribed burns and other means. Many of these treatment decisions were developed more than 20 years ago and have already been implemented. No fire management strategies were identified for the remainder of the District. However, outside of the resource management planning process, fire management zones have been developed. A total of 1,170,000 acres are managed for full suppression under Fire Management Zone One and Zone Two West. Moderate fire suppression occurs on 3,350,000 acres in Fire Management Zone Three and Zone Two East. Limited suppression occurs on 560,000 acres in wilderness study areas (Map 4). Management prescriptions for each zone are:

- Fire Management Zone One:
Aggressively attack all fires with the intent of holding 90% of all fires to less than 20 acres.
- Fire Management Zone Two: Includes higher elevation stands of pinyon and juniper, mixed with brush fields that have high value for wildlife habitat. Fire occurrence is fairly frequent, and larger fires are common.

- West of Highway 95, current fire management direction calls for aggressive initial attack of all fires and holding 90% of all fires to less than 10 acres.
- In the eastern part of the District, keep 90% of the fires at less than 2000 acres.
- Fire Management Zone Three: Respond to all fires, and use suppression actions to hold 90% of them to less than 2000 acres.
- In wilderness study areas, fire suppression activities are constrained by the objective to permit fires to play their natural role in accordance with the *Wilderness Interim Fire Management Plan*.

Continue Current Management Alternative Fire Management Zones Carson City District



AFFECTED ENVIRONMENT

This section describes the environment for potentially affected portions of the Carson City District. Since this document is tiered to the Lahontan, Walker, and Reno RMP/EISs, the affected environment sections of those EISs will not be repeated here. Rather, this section emphasizes the effects of fire and fire management on the environment. For more comprehensive descriptions, please refer to the EISs.

FIRE FREQUENCY

Fire frequency, or how often a given site burns, varies with vegetation type, the rate at which combustible fuels accumulate, and the frequency of ignitions, such as lightning strikes or human caused starts. Fuel loading is the term for how much combustible material from vegetation has accumulated on any given site. Fire in nature is the usual way fuels are reduced. Plants are adapted to survive and be maintained by fires of varying frequencies and intensities by means of thick bark, abundant seed, prolific sprouting, or the ability to establish where fire intensity is moderated by moisture or rocky or barren ground.

Before 1860, abundant herbaceous vegetation carried frequent wildfires which had profound effects on landscapes. Trees - highly visible on the landscape -- either had thick bark or grew in sites where they

found shelter from fires. Many smaller fires kept fuel loads lighter and maintained mosaic vegetation patterns. Such a variegated pattern provided stability by virtue of resistance to loss of vegetation on a large-scale. (Covington and Moore, 1994).

Beginning with the historic Comstock era, grazing by livestock removed much of the fuels that carried fires that kept woody vegetation in check, and may have caused a loss of seed sources for perennial forage plants. This grazing pressure gave trees an additional competitive advantage. Once tree dominance was established, many surviving understory plants further decreased due to competition for light, water, and nutrients. (Covington *et al*, 1994)

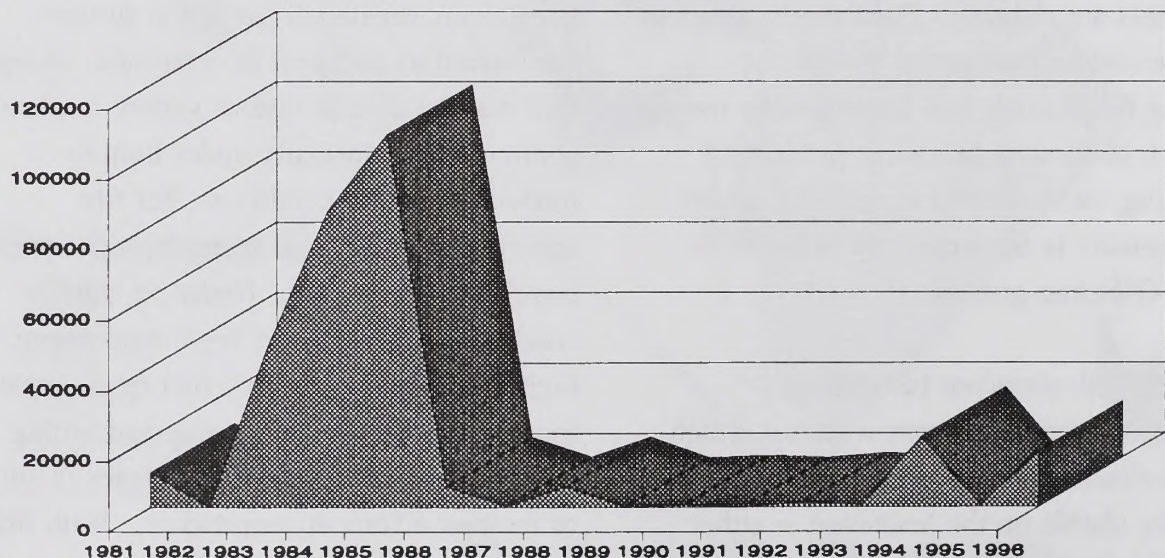
Historic logging removed most trees of usable size, so most of the current forest has grown in since. Young trees over large areas carry fire less frequently than herbaceous vegetation, so fire is further diminished as an agent of ecosystem change. Fire may be able to restore variety in plant communities, especially under light to moderate burning conditions, but fire suppression policies in recent history have largely prevented that. Under certain conditions of high wind, high temperature, high fuel loading, and low fuel moisture, the forest is susceptible to burning and setting plant succession back to early stages in spite of the best efforts at suppression. With little understory before such a timber stand-

replacing fire, there is little seed-source to restore ground cover with anything except annuals and a few pioneer perennials, many of which are considered undesirable weeds. (Arno *et al*, 1993)

The increased human ability to suppress wildfires in the last 50 years also has produced effects on the environment. Highly skilled personnel using improved techniques and equipment have been able to put out most fires at small size and low intensity. An unintended effect has been an increase in fuels in many areas. Fuel loading has reached high levels in many areas of the District, except in areas with low vegetation productivity and where fire has recently occurred.

The most frequent fire starts are in the western portion of the District -- in the rain shadow of the Sierra Nevada, where the incidence of dry lightning is high and the greatest concentrations of people cause fires. East of Highway 95, the fuels have not built up as much, fires tend to burn less severely, and the number of fire starts is fewer due to less human contact and lower incidence of lightning. Large fires have been occurring in the western part of the District on the average of one each year for the past few years. The area burned over the last fifteen years has averaged about 10,000 acres per year. It peaked in 1985 at 106,000 acres (Chart Two).

Chart Two: Carson City District Acres Burned



WATER

There are about 1100 springs and 140 miles of perennial streams on BLM administered land in the Carson City District (BLM, Water Source Inventory - 1982). Springs vary in size from intermittent seeps to those with flows exceeding 20 gallons per minute (gpm). However, seventy percent of these springs flow about one gpm or less. Stream flows vary seasonally as well as annually and are estimated to flow from a few gpm in low flow conditions in fall to over 50 cubic feet per second or more in spring.

The climate of the area is typical of the eastern Sierra rain shadow and the Great Basin, with most of the precipitation occurring in the winter and flows peaking in mid to late spring. Summer is usually dry; however, localized thunder showers can generate major runoff and local flooding. Annual precipitation averages from four inches in valley floors to more than twenty inches in the higher elevations.

Over the last 10 to 15 years, representative springs and streams have been sampled and analyzed for water quality. With some exceptions, most of the springs and streams have good quality water and meet suitability criteria for livestock, wildlife, and wild horse and burro use.

AIR QUALITY

Outside the cities of Reno and Sparks and some parts of Washoe County, the area meets air quality standards. The air quality is quite good and is characterized by relatively low concentrations of pollutants. Dust in various forms is the only pollutant which occasionally exceeds the criteria. It is generated from roads, dry lake beds, farming, fires, and related activities.

SOILS

The soils found within the Carson City District exhibit wide ranges in depth, erodability, and numerous other properties. They are typical of soils found in the western Great Basin and Sierra Front. Detailed descriptions can be found in published soil surveys.

Much of the District is classified as aridic and receives less than six inches of precipitation per year; much of that occurs during vegetation dormancy. The aridic areas support relatively sparse vegetative communities that do not burn readily. When the infrequent burn does occur, it is usually of a patchy, sporadic nature, and is not hot enough to destroy perennial root crowns or dormant seed reserves in the surface soil horizons. However, given the low precipitation range and common alkalinity, rehabilitation is not usually feasible. This can be a problem if noxious weeds or

problem species such as cheatgrass invade the site.

Most of the wildfires within the District occur in the areas that receive more than six inches of precipitation, especially along the Sierra Front. The soils in these areas generally contain more organic matter, have thicker A horizons, and are not as alkaline as the aridic soils. These soils support more productive plant communities and, if conditions are right, will burn hot enough to destroy perennial root crowns and seed reserves. Many soils just east of the Sierra Front have granitic parent material and can exhibit water-repellent soil properties, making erosion a higher risk. Rehabilitation is often successful in these areas.

VEGETATION

Elevations in the Carson City District vary from the 4000-foot valley bottoms to nearly 10,000-foot mountain peaks, with annual precipitation averaging four inches in the driest of the valleys up to more than 20 inches on the high peaks or the Sierra foothills. This range in elevation and in precipitation, which may occur within a span of less than 20 miles, produces distinct vegetative zones.

At the lower elevations in the four- to six-inch precipitation zone are found the salt desert shrub communities, comprised of shadscale, Bailey greasewood, four-wing

saltbush, or spiny menodora, mixed with a sparse perennial grass component of Indian ricegrass, squirreltail, and galleta. These salt-desert shrub communities historically had a low fire frequency. The non-native annual brome grass, *cheatgrass*, has begun to change this pattern. As cheatgrass increases in density in the upper end of the precipitation zones for these salt-desert shrub communities, the fire frequencies increase, and there is some risk of converting these communities into annual cheatgrass grasslands with very little plant diversity (Monsen and Kitchen, 1994).

The sagebrush/bunchgrass communities are at elevations above the salt desert shrub communities. Wyoming big sagebrush and low sagebrush begin at about the eight-inch precipitation zone and continue up-slope until they finger into the pinyon-juniper vegetation in precipitation zones ranging from 10 to 14 inches. Intermixed with the sagebrush are other shrubs such as ephedra, bitterbrush, desert peach, and spiny hopsage, along with varying percentages of perennial grasses. A low to moderate frequency of fire has played an important role in these sagebrush/bunchgrass communities, producing a dynamic plant community varying from forb/grass to grass/forb/shrub to shrub/grass as the length of time from the last burn increases (Benkobi and Uresk, 1996). Cheatgrass is an increasing component of these plant communities, especially in the lower (eight- to ten-inch)

precipitation zones. In these areas, it is necessary to reseed with bunchgrasses following fire to avoid conversion of the plant community to a low-diversity annual grassland.

Burned areas not successfully rehabilitated are highly susceptible to invasion by noxious weeds if there is an infestation nearby. Fire suppression activities also can unwittingly spread noxious weeds, as the plants' seeds are moved by vehicle tire treads.

The 10- to 14-inch precipitation zone provides the most dynamic fire relationship with plant communities. In this zone, the rockier or shallower, less productive soils produce less vegetation, which historically burned with less intensity than on more productive sites. This fire regime normally produced stable, open, old-growth pinyon-juniper stands with an understory of grasses, forbs, and shrubs. In the deeper soils, a more frequent fire occurrence has produced communities which vary all the way from almost pure forb communities through grass/forb/shrub to tree/shrub to tree/sparse understory. It is in this especially dynamic zone that long-term fire exclusion has produced the greatest changes from the historic pattern. Much of this zone is now in the dense tree/sparse-understory stage. (USDA Soil Conservation Service, 1983, 1984, 1991)

Opportunities for improving plant diversity are the greatest in the 10- to 14-inch zone. So, too, are the risks, because of many years of fire hazard fuel build-up. Although with the present vigorous fire response policy there are not many fires which burn more than a few acres, when the fire does escape initial attack, it burns wide and hot and frequently burns not only the dynamic tree/shrub zone but also the old-growth trees that would survive better under a regime of more frequent but less intense fire. (Shaw *et al*, 1994)

Dense stands of pinyon with heavy fuel loading produce hot fires when driven by wind under hot, dry conditions. This results in bare ground that is especially vulnerable to invasion by noxious introduced weeds. Pinyon pine and Utah juniper are shade-tolerant species that reproduce readily in an understory of either trees or shrubs but not well in a large area of bare ground. Land which is bare following wildfire will have an increased risk of erosion and also be at risk of cheatgrass or noxious weed invasion. This can be mitigated by reseeding to speed the return of perennial plants. Such reseeding efforts are attended by some risk of failure. (Aldon and Shaw, 1993)

In the Pine Nut Mountains and in Alpine County, California, stands of Jeffrey and Ponderosa pine (collectively referred to as yellow pine), western white pine, sugar pine, incense cedar, and white fir are found.

Yellow pines reproduce well in burned areas with bare soil and direct sunlight but not in an understory of shade and competing plants or a thick litter layer. Before Comstock-era clearcut logging, frequent fires maintained open stands of large yellow pines with very productive understory vegetation. Thick bark helps older specimens to survive surface fires which naturally control fuels and competing vegetation. In the absence of fire or other surface disturbance, this forest type does not reproduce well, and the ladder fuels of the competing vegetation constitute a fire hazard to the larger yellow pines, which are not as resistant to crown fires as they are to ground fires. (Allen, 1996)

Mountain mahogany patches grow at the upper elevations of the tree/shrub zone. Under a natural fire regime, this species needs fire to regenerate and is resistant to low-intensity burns, but it is vulnerable to total consumption in a high-intensity fire. Once totally burned, some mahogany stands have recovered from root sprouts or from seed stored in the ground, while other stands appear to be irreversibly destroyed.

Riparian zones, which are the green zones associated with water, may occur around springs, as meadows in the high country above treeline, or most prominently along creeks flowing primarily through the tree/shrub zone. Aspen, willows, and associated sedges, rushes, and shrubs such as wild rose readily sprout following fire.

Many of the lower elevation riparian zones grow cottonwood trees along with willow, rose, rushes, and sedges. All the smaller riparian plants sprout after fire, but the aspen and cottonwood trees, which survive quite well under low-intensity burns, are sometimes completely removed by extremely hot fire. (Brown and Simmerman, 1996; Cartwright and Burns, 1994)

In the elevations and precipitation zones above the dynamic tree/shrub zones is the mountain brush/grass zone. Here mountain big sagebrush and low sagebrush, with high elevation species of needlegrasses, fescues, and bluegrasses, form communities where fire frequently maintains a diverse pattern of successional stages. Fuel is usually not heavy, and cool temperatures and moist conditions generally moderate fire behavior and limit the extent of burning. The grasses increase after burning, but the shrubs soon return into these communities. (Barrow *et al*, 1996)

Several threatened, endangered, or sensitive plant species could be affected either directly by fire or by fire suppression activities. The only endangered species in the District is the **Steamboat buckwheat** (*Eriogonum ovalifolium williamsiae*), found in a one-square-mile area at the south end of Reno. **Williams combleaf** (*Polycitium williamsiae*), federal candidate category-1, is found around the edges of three small intermittent lakes east of Highway 395 and

between Reno and Carson City. **Webber Ivesia** (*Ivesia webberi*), and **Pine Nut Ivesia** (*Ivesia ptyocharis*), are found around meadow areas in the Carson Valley area. **Nevada Oryctes** (*Oryctes nevadensis*), a sensitive plant, is found throughout the Carson Sink north of Fallon.

WILDLIFE

Over 300 species of wildlife are recorded in the District. Large mammal species include mule deer, antelope, desert and California bighorn sheep, mountain lions, and black bear. Smaller creatures include coyotes, bobcats, and blacktailed jack rabbits. Still smaller mammals include fourteen species of bats, plus ground squirrels, mice, etc. Upland game species include sage grouse, chukar, mourning dove, cottontail rabbit, white-tailed jackrabbit, and valley and mountain quail. Four species of trout, including the federally-listed (threatened) Lahontan cutthroat trout are found in the limited streams. A wide variety of raptors, including golden eagle, prairie falcon, kestrel, red-tailed hawks and goshawks nest on public lands. There are large numbers of neotropical bird species using a variety of habitats, particularly stream riparian types. Waterfowl are not common, since the District lacks significant public land wetlands.

Mule deer, bear, and bighorn sheep are found in the mountainous areas. Most deer

live in the western portions of the District, and most bighorns in the eastern half.

Mountain lions range throughout. Upland game species are found mainly in mountainous terrain, while mourning doves use canyons, flats, and agricultural areas. Neotropical birds are found in all habitats, as are the raptors.

All of the large animals are opportunistic feeders. For example, mule deer prefer shrubs and forbs, but eat new growing grass in the springtime. They prefer antelope bitterbrush as a staple food, however, when they can get it. Bitterbrush is easily killed by hot fires, but the crowns often sprout if fires are not intense at ground level. A current major problem with bitterbrush is two-fold: natural reproduction has been limited under climatic conditions prevailing for the past 30 years, and it is very difficult to regenerate by seeding.

Bighorn sheep in the district prefer grasses but also eat browse and forb species when the need arises. Bears and coyotes are omnivorous and eat a wide variety of plant and animal foods. Mountain lions feed on any animals they can catch. The upland game species utilize vegetative types varying from desert scrub through sagebrush to pinyon-juniper. They do best in vegetation and topography that provides the right mix of food, water, cover, and space (elbow room) for them. The raptors take advantage of prey species where they can and nest on

rock outcrops or faces and in cottonwood, aspen or large pinyon trees. Vegetative types, topography, and available water determine which species will be present. Most of the bats roost in caves or mine shafts or in old buildings. They search for insects and fruit near canyon bottoms, riparian habitat, and lush vegetation.

Ranges such as the Gabbs Valley, Pilot, Stillwater, Clan Alpine, Desatoya, Pine Nut, Cedar, and Table Mountains have resident herds of mule deer. The ranges north of Reno, the south end of the Pine Nuts, the Wassuks, and the Excelsiors have migratory herds. These herds usually winter on public lands and summer on national forest and private lands, often in California. Fire has burned the majority of the winter use areas for the Lassen-Washoe migratory herd north of Reno in the past 20 years. In 1985 and 1986 alone, more than 100 square miles of habitat burned in their winter use areas.

Large fires and the associated loss of mule deer habitat are particularly difficult for deer, since they return to traditional use areas, despite the loss of food and cover, rather than colonize new areas. Mule deer do best where they have a variety of structural diversity: forbs and shrubs (sage and bitterbrush) and some grass for forage, broken country to hide in and find thermal cover in, and trees such as pinyon and juniper to escape into and keep warm under.

Wildlife habitat study areas in the Sand Hills and Petersen Mountain have been used for many years and are at risk of being lost to wildfire. These study areas provide valuable information about the effects of livestock grazing on wildlife habitat.

California bighorn sheep use the Virginia and Pah Rah Ranges on the west side of Pyramid Lake. Desert bighorns are found throughout mountainous areas in Churchill and Mineral Counties. These herds have been reintroduced into historic habitat by an aggressive program launched by the Nevada Division of Wildlife and BLM and funded by private contributions from organized sportsmen's groups. Antelope are found throughout the valleys of Mineral County, north of Reno, and to a lesser extent, in Churchill County. They will take advantage of burned areas for the forbs and tender victuals that come back if the fires are not too hot.

Sage grouse are found in very low numbers in the Pine Nut, Wassuk, Clan Alpine, and Desatoya ranges. They rely on sagebrush for food and cover and on riparian areas -- especially meadows -- right after the chicks hatch to take advantage of succulent vegetation and insects. Chukar partridges do well in rocky, sage-covered mountainous areas, as well as desert shrub, as long as there is adequate water and cheatgrass present.

The only place where fire has had a major impact on large wildlife species is along the Sierra Front. As noted above, considerable acreage burned north of Reno in the 1970s and 1980s (little of which was rehabilitated), with a consequent decrease in habitat quality and quantity for mule deer. In addition to large acreages of winter habitat burned, the area has undergone an eight-year drought, and continues to be encroached upon by residential subdivisions and other land developments. Deer numbers, particularly those of the Lassen-Washoe Interstate Deer herd, are at a low ebb (Bureau of Land Management, 1988).

Riparian habitats, such as meadows and streams with cottonwood, black willow, or aspen along them, are very limited in the District, amounting to less than one-half of one per cent of the land area, but they are very important to wildlife. Between 75 and 80 per cent of all vertebrate wildlife species use riparian habitats at one time or another during the year, and many of the neotropical birds in the District would not be present if there was no riparian habitat. The moist conditions, flowing water, and structural diversity of the vegetation attract wildlife. Riparian habitat structural diversity refers to large deciduous trees with smooth bark and easily probed surfaces, for example, when compared with adjacent sagebrush or pinyon-juniper. Large trees mean shade for mule deer and nesting habitat for birds.

Any fish which are found in the creeks survive much better if low intensity fire removes only a portion of the vegetative cover. High intensity fire, which consumes or kills the above-ground portion of the riparian vegetation, may leave the fish population very vulnerable to a complete die-off in the months before the vegetation regrows enough to provide shade and hold back sediments.

Lahontan cutthroat trout (*Onchorhynchus clarki henshawi*), federal-threatened, live in three streams in the Desatoya Mountains at the east edge of the District: Edwards, Willow, and Dens Creeks. Any special treatments to protect the limited riparian habitat for Lahontan cutthroat trout from the threat of severe wildfire may only be done with extreme caution and in formal consultation between the Bureau and the U. S. Fish and Wildlife Service. (Ironically, to leave these habitats exposed to the more serious threat of impacts from wildfire, without any treatments other than attempts at fire suppression, does not require such consultation.)

The **Sand Mountain blue butterfly** (*Euphilotes palliscens* spp.) is a sensitive species found in the Sand Mountain area east of Fallon. It is dependent upon a locally-growing buckwheat species.

WILD HORSES, WILD BURROS, AND HABITAT

Wild horse and burro herd use areas are identified in the Lahontan and Walker RMP/EISs. The only wild burros in the District live in the vicinity of Marietta in Mineral County -- a low precipitation, very low fire occurrence area. Wild horses are found in many distinct herd areas around the District. Wild horses prefer grasses, although they will forage heavily on brush if necessary.

Most of the horse bands in the District exhibit a seasonal pattern related to elevation and plant communities. The typical band of horses winters in the salt-desert shrub zone, moves up into the sagebrush/bunchgrass zone by late winter, and spends the summer on mountain brush/grass above the treeline of the pinyon-juniper zone. Other bands spend their entire lives in the lower elevation salt desert shrub and sagebrush/bunchgrass zones, while a very few bands spend nearly their entire lives in the high country above the pinyon-juniper zone. In mountain ranges which have not yet acquired a significant mountain lion population, some bands of horses spend a large portion of the year within the tree zone. In other areas, horses tend to avoid dense pinyon-juniper areas, both because of limited forage and because foals are vulnerable to ambush by mountain lions in the tree zone.

Wild horse foaling season occurs in the spring through early summer. The critical time of year nutritionally for the herds tends to be from late winter through the foaling season. Herds locate near available forage and water, usually in the upper parts of the salt desert shrub zone or the sagebrush/bunchgrass zone. By the fire season, the foals are normally at least two months old. It is quite rare for wild horses to be caught in a wildfire; the primary risk to horses from fire is short term removal of forage from a favored forage area. The primary benefits to horses are removal of the trees which hide mountain lions and a long-term increase in forage production following the burn.

LAND USES

Livestock grazing

About 90 percent of public land in the District lies within grazing allotments. Cattle or sheep can be caught and killed by fast-moving wildfire. It is unusual, however, for livestock to be burned by wildfire. Far more common is the disruption in forage availability caused by fire. Some forage is lost through burning, but most of the disruption comes as a result of fire rehabilitation efforts when all or portions of a grazing allotment are closed to grazing during subsequent growing seasons to allow plants to establish or recover in the burned area.

In the long term, forage usually increases dramatically following fire due to usually successful reseeding, and frequently the burned area can be used as a separate pasture. This improves grazing management for the entire grazing area by providing opportunity for more movement of the livestock during the grazing season.

Forest Resources

There is some demand for firewood, posts and poles, Christmas trees, pine nuts, and sawlogs. The Bureau sells about 5,000 Christmas trees and 400 cords of firewood annually. Public firewood and Christmas tree cutting areas have been established in the north, middle, and southern portions of the Pine Nut Mountains, which are used by residents from the more populated western side of the District. Similar areas have been established south of Hawthorne, in the Excelsior Mountains, and east of Fallon in the Clan Alpine Mountains. Rather than merely satisfy a public demand for commodities, these areas have been designed to authorize harvest where and in a way that the activity would check tree populations where natural disturbance agents, including fire, have not been in effect. Sawlogs have been selectively harvested in the Indian Creek Recreation Area as a means to protect the forest by reducing fire hazard fuels and to begin to restore desired ecosystem conditions.

Pinyon pine nuts are harvested commercially from the Clan Alpine Mountains, Desatoya Mountains, Gabbs Valley Range, Excelsior Mountains, and the Wassuk Range when seed production is adequate.

Noncommercial picking is very popular in the Pine Nut Mountains. Pine nut harvest is also a very important cultural tradition among Native Americans at many locations in the District.

Recreation and Tourism

The Indian Creek Recreation Area in Alpine County, California, includes a developed campground at Indian Creek Reservoir, hiking trails, and an interpretive area. The main boat launch site on the East Fork of the Carson River is located nearby. Popular activities include camping, hiking, fishing, and whitewater boating. The area is located in a very scenic forested environment. Recreation enjoyment is enhanced by the scenic Jeffrey pine forest. Current visitor use at developed sites is estimated at 50,500 visits annually.

The Walker Lake Recreation Area includes the shoreline and viewshed at Walker Lake. Recreation developments include a developed camping area and boat ramp at Sportsman's Beach. Popular activities include camping, boating, fishing, and bird viewing. Current visitor use at BLM developed areas is 61,500 visitors annually. Daily traffic on Highway 95, the main

tourist route between Las Vegas and Reno is 4,100 vehicles.

The Churchill County Recreation Area includes lands along the Highway 50 corridor east of Fallon, Nevada. A number of significant sites are located along this major tourist route. These include the Grimes Point Archaeological Area, Sand Mountain Recreation Area, Sand Springs Pony Express Station, Fairview Earthquake Faults, the Rock Creek Transcontinental Stage and Telegraph Stations, and the Cold Springs Pony Express Station historic sites. The corridor follows the route of the Pony Express Trail and the Lincoln Highway. Annual visitor use at developed BLM sites is estimated at 53,970 visits. Daily traffic on Highway 50 near Sand Mountain is 1,300 vehicles.

Dispersed recreation pursuits occur in the remainder of the District, where freedom of choice is greater and subject to less development and constraint. Key important natural and cultural features include wildlife habitat, waters and riparian areas, pinyon and juniper forested lands, local canyon landscapes, major ridges, old mining areas, and an extensive network of existing rough roads and jeep trails. The most popular activities include off-highway vehicle exploring and play, horseback riding, hiking and walking, mountain biking, hunting, nature and wildlife viewing, historical site viewing, and special outdoor events.

Most of the use occurs in the western third of the Carson City District near the urban areas. The wildland/urban interface lands at the western edge of the District have become increasingly important to the urban population for open space, quality of life, and recreation close to home. Important areas include the Pine Nut Mountains, the Virginia Range between Carson City and Reno, the Pah Rah Range, and the Virginia Mountains near Pyramid Lake.

In the northern part of the District including Washoe and Churchill Counties, annual visitor use is estimated at 489,000 visits. Areas of sensitive or unique value within the extensive area include the following:

- *The Pony Express and California Emigrant National Historic Trails.*
- *The Petersen Mountain Natural Area* north of Reno provides a natural setting for nonmotorized recreation uses in a undeveloped setting.
- *Incandescent Rocks Scenic Area of Critical Environmental Concern (ACEC)* lies at the south end of the Virginia mountains near Pyramid Lake, and contains unusual and colorful rock formations. The area is popular for rock climbing, hiking and exploring by vehicle on existing trails.

- *Steamboat Area of Critical Environmental Concern (ACEC)* contains unique geological formations and hot spring activity.
- The narrow, deep *Big Dens Canyon* in the Desatoya Mountains is an oasis of riparian vegetation, Lahontan cutthroat trout, and waterfalls and a popular spot for locals to camp, hike, and explore.
- *The Red Rocks Scenic Area* is a colorful scenic geological formation adjacent to U. S. Highway 395 north of Reno.
- *The Stillwater, Clan Alpine, and Desatoya mountain ranges* offer outstanding opportunities for primitive and unconfined recreation in a very scenic and remote setting for exploration on backcountry primitive roads, hunting, fishing, hiking, and backpacking.

In the southern part of the District including Carson, Douglas, Lyon, Mineral, and Storey Counties, annual visitor use is estimated at 131,000 visits. Areas of sensitive or unique value include:

- *Marietta Historic Site and National Wild Burro Range* contains wild burros and a historic mining town.
- *Prison Hill* in Carson City is popular for hiking, horseback riding, mountain biking, running, and motorcycle riding.

Annual use by local residents is estimated at 9,000 visits.

- *Wilson Canyon* is located on the West Walker River near Yerington. The area is popular for fishing, picnicking, camping, and motorcycle riding.
- *Virginia City National Historic District* includes the public lands around Virginia City, which contain nationally significant historic features associated with the Comstock mining era. Sites on public land include cemeteries, railroad and hand-built road grades, mine workings, headframes, and millsites. This area and the adjacent Jumbo watershed receive heavy visitor use. Popular activities include mountain biking and motorcycle riding on roads and trails, historic sightseeing, and competitive and organized events.

Realty Management

Various lands and realty authorizations have been granted which allow facilities on public land. These authorizations include rights-of-way, Recreation and Public Purposes Act leases, airport leases, and permits. Rights-of-way include both linear facilities such as power lines, telephone lines, and roads and site-type facilities such as communication sites, wells, and water tanks. Recreation and Public Purposes Act leases include a wide variety of facilities such as schools,

government buildings, churches, parks, recreation sites, cemeteries, and landfills.

Airport leases generally authorize small airfields which are privately operated.

Permits authorize limited facilities such as apiary sites or minor structures.

Most site type rights-of-way, Recreation and Public Purposes Act leases, airport leases, and permits occur in or near cities and towns. These facilities provide services to the communities they are located adjacent to. Linear rights-of-way and communication site rights-of-way frequently occur in rural areas. These facilities provide services linking communities. Facilities occurring near cities and towns are thus in areas where fires are quickly suppressed due to the risk fire poses to lives and property. Facilities occurring in rural areas are exposed to fires which are usually not suppressed as quickly as in urban areas.

The vulnerability of facilities to fire varies with the type of facility and details of its construction. A power line built with wooden poles will be more susceptible to fire damage than a high voltage power line built with large steel towers. An overhead telephone line will be more susceptible than a buried telephone line or pipeline. It is the responsibility of the facility owner to design and construct his facility to minimize possible damage from natural hazards including wildfire. The BLM makes reasonable accommodations to facility

owners in the authorization process to recognize and deal with natural hazards.

WILDERNESS

The Carson City District includes nine wilderness study areas (WSAs) totalling approximately 579,200 acres and shown on Map 1, Page 3. These areas are roadless, natural in condition, and possess outstanding opportunities for solitude or primitive and unconfined recreation. WSAs represent the most undeveloped, scenic, and remote areas in the District.

The Clan Alpine Range WSA (196,128 acres), Stillwater Range WSA (94,607 acres), Desatoya Mountains WSA (51,262 acres), and Job Peak WSA (90,209 acres) are located in Churchill County east of Fallon, Nevada. The southern half of the Augusta Mountain WSA (approximately 51,000 acres) is located at the northeast corner of the District in Churchill County.

The Burbank Canyons WSA (13,395 acres) is located in Douglas County at the southeastern end of the Pine Nut Mountains. The Gabbs Valley WSA (79,600 acres) is located in Mineral County 30 miles east of Hawthorne. All of the eastern WSAs are representative of Great Basin mountain ecosystems.

Two units are located in Alpine County near Markleville, California, on the eastern slopes

of the Sierra Nevada Range. The Carson-Iceberg WSA is a small unit of 550 acres contiguous to the Carson-Iceberg Wilderness managed by the U.S. Forest Service. The Slinkard WSA is located on both sides of the Alpine-Mono County line just south of Monitor Pass; the Alpine County portion (2,450 acres) lies within Carson City District.

Complete descriptions and maps of WSAs in Nevada are available in the October 1991 Nevada Statewide Wilderness Report at all Nevada BLM offices. Descriptions of the Carson-Iceberg WSA and Slinkard WSA are available in wilderness inventory files at the Carson City District Office.

CULTURAL RESOURCES AND NATIVE AMERICAN RELIGIOUS CONCERNS

The public lands managed by the Carson City District have been occupied for thousands of years; Native American groups used both valleys and mountain ranges to procure a variety of plant, animal, and mineral resources. As a result, the District contains a multitude of prehistoric sites associated with Native American life. Archaeological sites include petroglyphs and rock alignments, rock shelters, caves, quarry sites, open camp sites, and task sites. Many of these locations may be found near water sources. They may also appear on saddles and ridge tops within mountain ranges,

within sand dunes, along ancient lakes, and at other places where important resources could be obtained.

Some resources are still utilized by Native Americans. For example, pine nuts were an important food source and the pinyon is still an important element of Native American cultures. Pinyon pines are sacred to many, and the health, diversity, and stability of pinyon woodlands is of vital importance. In addition, riparian plants such as willow, are still gathered by local Native Americans to construct cradle boards for infants. In the past, and to some degree today, Native Americans maintained and harvested these plants to ensure superior propagation (Hanes; 1988; 7,14-16).

Sites or specific areas significant to Native American religious or other cultural activities are given the maximum consideration under the law. Information about areas of significant religious or traditional importance may not be readily shared outside the tribe. It is important that these areas remain confidential, and therefore they will not be listed in this document. Some mountain ranges contain resources important to Native American culture or may represent important landscape features within Native American cultures.

There are many historic mining/milling sites located throughout the District including the public lands within the Virginia City

National Historic Landmark. Additional historic sites include early immigrant trails, historic roads and railroad grades, borax and salt works, the Pony Express route and stations, stage stations, townsites, ranching sites, wood cutting and processing sites, and historic irrigation/water networks.

Since fire effects to cultural resources have not been extensively studied in this area, actual, direct effects from fire are not well known, aside from the obvious destruction of wood structures. Both prehistoric and historic sites are subject to loss of physical integrity through erosion and may be subject to illegal collection after a fire since loss of vegetation increases visibility. In addition, firefighting activities and mop-up can severely damage or destroy archaeological sites (Hanes; 1988; 13-14).

In addition to these general observations, a fire in the Sunrise Pass area of the Pine Nut Mountain Range destroyed pinyon trees last year. This area was very important to both the Washoe and the Yerington Paiute peoples. In the early 1980s, a fire within the Virginia City National Historic Monument badly damaged or destroyed wooden grave markers and enclosures within the Gold Hill Masonic cemetery and accelerated deterioration of the site.

Studies conducted after major fires in other areas have yielded the following observations on prehistoric sites: in

extremely intense, hot fires, bone or other organic material can be either consumed or badly damaged; stone artifacts may break; pictographs may be destroyed and cliff faces of sandstone and limestone may exfoliate destroying rock art; pottery also may be badly damaged; damages may occur to artifacts from 2 to 3 inches below the surface, although the damage may be deeper if the roots of a shrub or tree burn; and opportunities for dating through C-14, obsidian hydration, and archaeo-magnetism may be lost (Bellomo, 1991; Connor, et. al., 1989; Connor and Cannon, 1991; Hanes, 1988; Johnson, et. al., 1991; Picha, et. al., 1991; Rowlett, 1991).

Historic wooden structures are at risk from fire. In addition, historic glass and ceramics can also be damaged when subjected to extremely high temperatures.

VISUAL RESOURCES

Public lands in the Carson City District have a variety of visual values, from common landscapes to outstanding values found in the diverse and rugged mountain ranges in the northeastern part of the District. The public is most sensitive to changes in the landscape along major travel routes, adjacent to communities, or in special areas such as areas of critical environmental concern, wilderness study areas, and recreation areas.

High scenic values in the western portion of the District are found in Alpine County, Red and Burbank Canyons, the Pine Nut Mountains, Washoe Valley, the Virginia and Pah Rah Ranges, Long Valley, the Petersen Mountains, and in landscapes adjacent to the urban areas.

The visual quality of undeveloped lands within the view of Washoe, Carson, and Douglas County residential areas are of high concern and value to the public. The Virginia City National Historic District is a unique cultural and visual landscape. Although past mining disturbance has impacted natural scenic values, the historic landscape has high public educational, interpretive, and scientific value.

Outstanding scenic values in the eastern portion of the District include the Wilderness Study Areas, the Stillwater, Clan Alpine, and Desatoya Mountain Ranges, Sand Mountain, Walker Lake, the Wassuk Range, the Excelsior Mountains, and the viewshed to the south across Teels Marsh and Pilot Peak. The Highway 50 and 95 corridors are significant tourist routes with moderate volumes of traffic.

Visual Resource Management (VRM) objectives have been established for the western portion of the District and are identified in the Walker and Lahontan Resource Management Plans.

SOCIAL ECONOMIC CONDITIONS

The Carson City District encompasses one of the fastest growing areas of the nation. Its current population of 470,000 people lives in eight Nevada counties (Washoe, Carson City, Douglas, Churchill, Lyon, Mineral, Nye, and Storey) and in three California counties (Lassen, Alpine, and Plumas). The region includes three National Forests, six Indian Reservations (including two of the largest in the nation -- Pyramid Lake and Walker River), and two major military bases. Over eighty percent of the region's population is concentrated in the western part of the District in the Sierra Front urban area that includes Reno, Sparks, Carson City, and Gardnerville. This area has a population of about 390,000. The area has been growing at a rate of nearly three percent per year since 1980. This extended period of growth has generated considerable demands on public lands, particularly for open space, recreation, and realty actions in the western portion of the District.

Although the economy of the region is focused on gaming-oriented tourism in Washoe County, tourism occurs throughout the region and plays a particularly large role in the economies of Alpine, Storey, and Douglas Counties. There is also a major warehousing industry in the Reno-Sparks area and a modest, but growing manufacturing sector in Washoe, Carson City, Douglas, and Lyon Counties.

Government employment is significant in Churchill County (Fallon Naval Air Station), Mineral County (Hawthorne Army Ammunition Depot), Lassen County (Sierra Army Depot and State Prison), and Carson City (State Capitol). Agriculture provides a significant source of income in Churchill, Lyon, and Douglas Counties. The region as a whole has a higher than national average household income. Concentrations of low income or minority households occur in central and northeast Reno, Sun Valley, and Indian Reservations.

Overall, public lands directly provide only a minor percentage of income and employment to the regional economy. Most of this is in the tourism/recreation, livestock, and mining sectors. However, public lands are highly valued for public and private infrastructure needs, such as powerline and communication site rights-of-way and schools, parks, and other public facilities.

Public lands are valued by many residents for their contribution to recreation and open space amenities. These amenities contribute to the region's high quality of life, which is an important factor in long-term sustainable development. Increasingly, businesses are attracted to the region because of quality of life factors.

Public land open space and recreation amenities are also reflected in real estate values, which are higher for properties with

views of open space and for properties adjacent to open space public lands (Leck, 1996). Views of forested mountains are particularly valued.

ENVIRONMENTAL CONSEQUENCES

PROPOSED ACTION

Fire Frequency

Under the proposed action, it is projected that there would be a continued risk of severe fires over the next 20 years, which will be considered the short term for purposes of analysis. Compared to current management, there would be an increase in the number of intermediate size fires (10 to 1000 acres) and a decrease in the number of small fires (less than 10 acres) in the western part of the District. In the eastern part of the District, there could be a small increase in the number of larger fires. Overall acreage burned during this period would increase District-wide.

In the long term (i.e., beyond 20 years), the effects of changes in management would result in more intermediate, cooler fires, particularly in the western part of the District, compared to current management. Major changes are not anticipated in the eastern part of the District, except that large fires there would continue.

Water

Effects of fire on water resources would vary from site to site, and the type and extent of impacts largely depend upon factors like fire intensity, fuel type, area

soils and geology, slope steepness, proximity to springs and streams, and climatic regime. In the short term, fire could exert pronounced effects on hydrologic processes, which can lead to accelerated erosion and to reduced land stability. Overland flow, peak flows, and total discharge are expected to increase. Water quality degradation could occur. This includes, but is not limited to, increased sedimentation and elevated turbidity levels. Elimination of streambank cover can cause a serious threat to aquatic life.

In the long term and compared to the current management, adverse impacts enumerated above would be much less pronounced than in the short term. The predominant effects on water resources would be beneficial in the long term in terms of reduced erosion, land stability, water quality, and stability of streambank cover.

Air Quality

Over the short term, the air quality in and around the burned areas is expected to degrade, because there would be more fires of all sizes in addition to large fires in areas where they could not be suppressed. Particulate matter, carbon monoxide, nitrogen oxide, volatile organic compounds and fugitive dust concentrations could be elevated. Cumulatively, over the thirteen

western states, prescribed burning would result in increases in annual carbon monoxide, nitrogen oxide, inhalable particulates, and volatile organic compound emissions, but by insignificant amounts (USDI, 1991).

In the long term, provided the protective vegetative cover is established quickly, the air quality would stabilize and improve. The threat of large, severe fires would lessen, so that source of smoke would diminish. Even though smoke would be more common, it would be produced for shorter periods of time and be more controllable.

Soils

In the short term, the risk of surface layer soil losses and other negative effects (described in the continue current management alternative) from large catastrophic wildfires would continue to be high for much of the western part of the district, with a slightly less risk of degradation for Category C lands north of Reno.

In the long term, the risk of losses to surface soil layers from large severe wildfires should decrease, especially in the western part of the District as the burn intensities of wildfires lessen. The cycling of organic matter into the surface soil would tend toward more natural conditions, with

relatively diverse natural plant communities and a more natural rate of erosion. These effects would be less obvious in the eastern part of the District, where fuel loading and cheatgrass infestation is not such a problem. The effects of fire on soils in category A management areas would be no different than under current management; however, these areas are small and should respond readily to emergency fire rehabilitation measures. Large precipitation events immediately following fires would continue to cause localized erosion; however, the improved natural ground covers, both basal and canopy (shrub) would tend to minimize the negative effects to the soil surface. This should also hold true in the pinyon-juniper zone, where canopies would be more open with increased understory vegetation and a more stable soil surface.

Vegetation

In the short term, an increased acreage of pinyon-juniper and big sagebrush vegetation would convert to earlier successional grassland as a consequence of an increased number of intermediate-sized fires along with one large, severe fire per year on average. In the long term, a greater variety of successional stages would gradually appear on the landscape as the intermediate sized burns produce a variety of plant communities, beginning with the earlier successional grass and forb vegetation and

progressing through shrub to young tree stages.

More diverse and patchy patterns would characterize vegetation types as fire is allowed to exert its natural effects.

Ecosystems would increase in stability as the threat of large, intense fires decreases and the intermediate sized burns develop into natural breaks. Where large fires still occur (i.e., where patterns of vegetation have not yet become more varied), successional stages would be set back to early successional forb/grass communities on the burned areas. Perennial understory vegetation and seed sources would be reestablished where fire rehabilitation efforts are successful and where sufficient vegetation remains to regenerate.

Fire rehabilitation in the six- to ten-inch precipitation zones is chancy with significant risk of failure to obtain seedling establishment. These lower precipitation zones are the area in which the annual cheatgrass is a well-adapted competitor. Some areas in the upper end of the salt-desert shrub communities and the lower end of sagebrush communities would convert to an annual grassland when fire rehabilitation efforts are unsuccessful in these lower precipitation zones.

In the long term, pinyon-juniper woodlands would return to more open stands of older trees on those rocky or barren sites which afford some measure of shelter from hotter

fires. On sites more exposed to fires, pinyon- juniper would grow in a greater variety of seral stages in association with a greater variety of other plants. It would take decades for overall change to be manifested, and the threat that large, severe fires would clear thousands of acres of present woodlands would persist until a patchwork pattern of differing vegetation and seral stages finally lowers the risk of total tree removal.

In the short term, there would continue to be occasional stand-replacing fires. When woodland sites become severely burned over large areas, it may take decades for pinyons and junipers to return.

In pinyon-juniper stands, yellow pine forests, and aspen and cottonwood groves, the application of forest treatments such as selective tree removal, prescribed fire, and fuels management techniques would reduce the threat of severe fire and increase the stability and longevity of the forest ecosystem and associated resource values in areas with the highest priority for protection.

The endangered and sensitive plants in the District would be well protected by full fire suppression and the constraint on fire vehicles in areas where the plants occur.

Wildlife

Mule deer habitat would be enhanced in the long-term, especially along the Sierra Front where prescribed burns would be made and where wildfires would be allowed to burn more acres than they were for the past five decades. Deer would readily adapt to the patchiness caused by fires as they take advantage of the increased edge effect. Key mule deer areas would also be rehabilitated where needed. Wildfires that are allowed to burn in the Stillwater, Clan Alpine, and Desatoya mountain ranges would also significantly benefit mule deer habitat. The Sand Hills area under full suppression (to protect the vegetation studies and mule deer habitat) would continue to supply mule deer with forage, as well as provide human observers a chance to see how the vegetation looked 40 years ago, compared to the present. The Petersen Mountain area, under full fire suppression, would continue to provide forage and cover for deer from the Lassen Washoe Interstate Deer Herd.

Occupied desert bighorn sheep habitat would also benefit in the Stillwater, Clan Alpine, and Desatoya ranges as well as areas such as the Wassuk Range, the Excelsiors, and the Gabbs Valley, Pilot Mountain, and Gillis ranges, since fires in these areas usually set back plant succession, and the resulting forbs and grasses would provide more forage for these animals.

Antelope habitat would benefit by fires wherever the fires and antelope habitat overlap, since forbs -- an important habitat component -- usually are among the first plants to grow following fire.

Trout, including the threatened Lahontan cutthroat, would benefit over the long term from full suppression and protective fire hazard treatments recommended for stream riparian habitat.

No impacts to threatened, endangered or sensitive species are anticipated. The buckwheat that sustains the Sand Mountain blue butterfly would continue to be protected from fire and fire vehicles crushing it. Full protection for the Sand Hills Exclosure and Petersen Mountain vegetation study area would be provided.

Many species of neotropical birds would also benefit from the protection and treatments proposed for riparian areas, since they would have continued nesting, foraging, and brood-rearing habitat provided by the protected aspen, cottonwoods, and willows.

On a cumulative basis, these beneficial impacts would be enhanced in the western part of the District by land use decisions made in 1996 for the Carson City Urban Interface Area to manage public lands for open space and wildlife resources rather than disposal for development. In the eastern part of the District, beneficial impacts to

wildlife from improved fire management could potentially be offset by adverse impacts from increased military ground training activity associated with the proposed Navy's Range Training Withdrawal.

Wild Horses, Wild Burros, and Habitat

Wild horses and burros are wary and mobile animals and are seldom at risk of physical harm from fires. This low level of risk would continue in the short term and be reduced in the long term as the number of severe (large, intense, fast-moving) fires is reduced with changes in the vegetation patterns.

One primary risk to the horses or burros involves short-term loss of forage when fire burns a favored area. If the burned area is extensive, as from severe fire, horses or burros may need to be removed from the area in order to permit rehabilitation. If the area is relatively small, as from a prescribed burn or from an intermediate sized burn, temporary fencing to control access to the burned area becomes more practical than animal removal. A second risk to horses and burros occurs when fire burns near, but outside, the boundary of the herd area. If the animals are so attracted to the new burned area that they move permanently from the herd area to a location outside the herd area, the BLM is forced by law to remove the animals from the area permanently. The threat of that removal in

the long term would decrease most under the proposed amendment.

Prescribed fire would be a more common tool and can be more readily used to create attractive forage areas within the horse or burro herd areas. With well-located prescribed burns, the horses would be less likely to be attracted permanently to areas outside the herd area. The wild burros inhabit an area with a very low fire frequency, and their diet depends heavily on shrubs. The burros are not likely to be appreciably impacted by the proposed amendment.

In the short term, some horse herd areas would gain in forage base from burns which convert shrub or tree vegetation to grass/forb vegetation. In the long term, virtually every horse herd area would benefit from an increased forage base as fires produce more grass vegetation and less of the tree/shrub vegetation that has less forage value and provides more cover for the mountain lions which prey on horses.

Land Uses

Livestock grazing. In the short term, there would be some disruption to livestock grazing as the BLM closes the more numerous intermediate sized burns to growing-season grazing to foster rehabilitation. Smaller burns, however, are more likely to be amenable to the use of

temporary fencing or to keeping livestock in a different part of the grazing allotment than might be possible with a large fire which burns a large portion of the grazing allotment. In the longer term, the areas converted to grass/forb vegetation from the present tree/shrub vegetation would benefit livestock production by providing an increased forage base.

Forest Resources. The sources of woodland and forest products would remain available for harvest in a way that would restore, maintain, and enhance ecosystem values. In the short term, more acreages of trees would be killed by small and medium fires than under current management. In the long term, the risk of losing large acreages of nut-bearing pines to wildfire would be reduced, and pinyon-juniper woodlands would become more stable and productive than at present. The proposed action would restore forest health, diversity, and stability to pinyon and juniper communities to a greater degree and sooner than would either alternative.

Recreation and Tourism. Infrequent intermediate sized fires would occur in remote and scenic locations in the eastern part of the District. In the short term, there could be a loss of recreation quality in specific drainages and ridges where attractive tree and shrub cover is lost. A small number of recreationists would be temporarily displaced to other similar

locations in this region. In the long term, wildlife viewing and hunting would be enhanced. No changes are expected at sparsely vegetated recreation sites such as Grimes Point, Sand Mountain, Wilson Canyon, and Walker Lake.

The impacts to recreation use in the areas proposed for fire management categories B and C in the eastern part of the District would continue to be mixed over the short term as both managed and uncontrolled wildfire occurs. Intermediate to large fires would continue to have local negative impacts to recreation values associated with a loss of tree and shrub cover and scenic value. Over the short term, there could be a loss of local natural and scenic recreation values due to increased management practices that remove tree and shrub cover. These impacts would be most prominent near residential areas where people are most sensitive to change and view existing conditions as a pleasant component of their recreation activities and quality of life. In the long term, and at a larger scale, the impacts would be beneficial as the potential for even greater adverse impacts from large, severe fires is reduced.

Realty Management. In the short term, potential property damage to some realty authorized facilities would increase due to an increase in burned acreage. This would primarily be concentrated in the western part of the District due to higher concentrations

of facilities and a greater frequency of fire. The occurrence of a few more large fires in the eastern portion of the District would not necessarily be accompanied by a significant change in potential for damage due to the lower concentration of facilities and the lighter nature of the fuels present.

In the long term, as the potential for large severe fires decreases in the western portion of the District, potential property damage to authorized facilities would decrease. In the eastern portion of the District there would be a few more large fires, but -- as in the short term -- there would not necessarily be a significant change in potential for damage.

Wilderness

The objectives in the District Interim Fire Management Plan to allow fire to play a natural role would continue under this alternative, with the exception that there would be a higher level of suppression and management activity in the Edwards Creek, Willow, and Dens Creek watersheds in the Desatoya WSA. Most fires in the eastern WSAs, whatever their origin, would be monitored and allowed to burn to an intermediate size. A few fires of small to large size would be anticipated in the eastern wilderness units and Slinkard WSA over the next 20 years.

Impacts to wilderness values in the eastern units as a result of fire suppression

techniques would be largely eliminated, and apparent naturalness would be maintained in most cases by allowing uneven and more natural burn patterns to occur. The eastern units are diverse in vegetation and topography and severe burning throughout a unit is not anticipated. There is a possibility of a larger fire removing most of the vegetation across more than one drainage or hillside. Short-term negative impacts to opportunities for solitude, primitive and unconfined recreation and scenic supplemental values could occur due to loss of vegetation, but in the long term, the area would recover.

In the longer term, the impacts to wilderness values in the Burbank Canyons WSA would be enhanced as the potential for large-scale severe fire is reduced in the Pine Nut Mountains and smaller to moderate natural appearing fires become more common in the Pine Nut Mountains.

Cultural Resources and Native American Religious Concerns

In the western part of the District, the use of such activities as prescribed burns and wood cutting is not expected to produce significant impacts, since these types of activities are subject to standard operating procedures and laws protecting cultural resources and Native American concerns. During the short term, the potential for severe fires would continue. In addition, the use of natural fire to achieve

management goals may initially harm some cultural resources through the direct effects of fire and/or fire suppression or management activities. In the long term, there would be a decrease in the number of large, severe fires, which should benefit most cultural resources through decrease in erosion potential, direct effects of intense fire, visibility of numerous cultural resources for illegal collection, inadvertent damage from fire suppression activities, and loss of large tracts of vegetation which are important to Native Americans. Wooden structures would continue to be vulnerable to fire unless protective fuels reduction treatments are undertaken.

The decreased intensity of fire suppression activities in the eastern part of the District may be beneficial to cultural resources through reduction of inadvertent damage by fire suppression activities. Acreage burned would be larger than currently burned. Larger acreage burned may increase the potential for illegal collection of cultural resources through visibility. Larger areas may also increase the erosion potential. The use of natural fire to achieve management goals may initially harm some cultural resources through direct effect from fire. However, in the long term, the fuel load would be precluded from building as it has in the west, which would reduce the potential for large, severe fires which should ultimately be beneficial for most cultural resources.

Visual Resources

There is a potential for short-term negative impact in the eastern part of the District, where tree-covered hillsides or drainages are burned. Long term impacts would be neutral to positive depending on the location and severity of fires. Fire patterns are anticipated to be more irregular and varied in severity and character. Individual burned areas would recover and are anticipated to appear natural in the long term. The most scenic mountain ranges in the eastern part of the District would remain scenic and diverse in visual character in the long term.

In the western part of the District, strong visual impacts from fires would continue to occur in the short term as both management efforts are increased and medium to large unplanned wildfires occur. In Alpine County and select urban interface areas, intensive management and prescribed burning would minimize the potential for unplanned fire to completely remove the Jeffrey and pinyon pine tree cover. In the long term, a pattern of more medium sized, irregular, and less severe fires should result. Visual impacts would be positive as more diverse and uneven aged fire patterns are created.

Social Economic Conditions

In the short term, localized reductions in scenery-related real estate values and

residential quality of life could occur from an increase in burned acreage. This would be concentrated in the Sierra Front Counties of Washoe, Lassen, Plumas, Carson City, Douglas, and Lyon.

Minority and low income families are not expected to be disproportionately affected by the proposed changes in fire management.

In the long term, as the potential for large severe fires decreases, potential reductions in scenery related real estate values and residential quality of life would decrease. Long-term improvements in recreation, visual, wildlife, and other ecosystem-related values could result in improving the sustainability of development in the region, since many businesses are attracted to the region based on its quality of life.

ALTERNATIVE A

Fire Frequency

This alternative implements most of the same features as the proposed action, and would result in similar fire frequency affects - a continued risk of severe fires in the short term, an increase in intermediate size fires and a decrease in the number of small fires. Overall acreage burned during this period would increase District-wide. In the long term, there would be more intermediate, cooler fires, particularly in the western part of the District. However, with more areas emphasizing a higher level of fire suppression, compared to the proposed action, it would take longer for the natural process of fire to become integrated into ecosystems. Risks of severe fires would continue over a longer period of time, the increase in intermediate size fires would be less and the decrease in small fires would be less. In the eastern part of the District, the increase in larger fires would be less than under the proposed action.

Water

The short-term impacts on water resources would be the same as described under the proposed action. The long-term impacts would be more severe, because the threat of large fires would persist longer. Compared to the continuation of current management in the long term, however, this alternative

would result in less adverse impact and more beneficial effects.

Air Quality

Impacts on air quality are anticipated to be the same as in the proposed action.

Soils

The risk of surface layer soil losses and other negative effects (described in the continue-current-management alternative) from large catastrophic wildfires would continue to be high for the western part of the District in the short term, and relatively unchanged from the present conditions in the eastern part of the District, with no negative effects in the salt-desert shrub communities.

In the long term, conditions should reflect more desirable fire frequency and fuel loading characteristics, as well as more stable understory vegetation in the sagebrush/pinyon-juniper zones in the west. The effects of fire on soils in category A management areas would be no different than under current management; however, these areas are small and should respond readily to emergency fire rehabilitation measures. Large precipitation events immediately following fires would continue to cause localized erosion under this and other alternatives.

Vegetation

In the short term, fewer acres would be burned than under the proposed action, and less of the land area would return to the earlier successional stages of forb and grass vegetation. About the same number of severe fires would burn in the short term, so the acres of large scale tree or brush stand-elimination would be the same as under the proposed action, but there would be fewer intermediate fires creating early successional patterns as more fires, especially in the western portion of the District, are stopped at small size.

In the long term, a patchwork pattern of differing vegetative seral stages would lower the risk of severe burns than under current management. However, more acres would return to the grass/forb vegetative stage than under the proposed amendment, because the longer time frame of achieving a patchy seral-stage diversity would expose tree and shrub stands to an extended period of vulnerability to severe fires.

Full protection would be provided for the endangered and sensitive species as well as for the Sand Hills and Petersen Mountain vegetation study exclosures.

Wildlife

Deer habitat would take longer to improve under Alternative A than under the proposed

action. There would be fewer intermediate and more small fires, which would not be as conducive to enhancement of edge effect.

In the short-term, there would be no difference, and the risk of large, catastrophic fires would last longer under this alternative.

East of Highway 95, limiting unplanned fires to less than half of a major drainage would do less to improve big game habitat than either the proposed action or current fire policy.

Alternative A would do less to improve wildlife habitat than would the proposed action, but more than the current management, over the same span of time.

Wild Horses, Wild Burros, and Habitat

In the short term, the risks and the benefits to wild horses and burros are similar to the proposed action: there is slight risk of physical injury by fire; some potential for temporary loss of forage, some risk of animals being attracted permanently outside the herd area because of an adjacent burn, and some risk that a very large burn would require removal of animals from the area in order to enable vegetative rehabilitation. In the long term, this alternative, because it would result in larger areas converted to grassland from present tree/shrub communities, would provide wild horses with a more favorable habitat having more

grass and less cover for predators, compared to the proposed action.

Land Uses

Livestock grazing. Livestock operators in the eastern portion of the District would experience impacts very similar to those under the proposed action: some disruption to grazing when burned areas are closed to growing-season grazing for rehabilitation, but a rapid increase in forage base as the burned area begins producing grass/forb vegetation rather than tree/shrub vegetation.

In the western portion of the District, such as in the Pine Nut Mountains, greater emphasis on fire suppression, compared to the proposed action, would reduce the short-term likelihood of disruption of grazing, but would also leave the land in a relatively low forage producing condition in the short term. In the long term, fire could escape suppression efforts and convert large areas to a grassland from the present tree/shrub situation. However in the long term, there would be a reduced risk of severe fire damage than under current management. Just as has occurred in the southern end of the Pine Nut Mountains, the other portions of the western side of the District would be converted to large, grassy burned areas with a larger forage base than currently is produced.

Forest Resources. The sources of woodland and forest products would remain available for harvest in a way that would restore, maintain, and enhance ecosystem values. In the short term, more acreages of trees would be killed by small and medium fires than under current management. In the long term, the risk of losing large acreages of nut-bearing pines and other tree species to wildfire would be reduced, and pinyon-juniper woodlands would become more stable and productive than at present. However, it would take longer to reach this more desirable condition than under the proposed amendment, and during that time, more acreage of pine nut production would be lost.

Recreation and Tourism. Compared to the proposed action, the potential for short-term impacts to dispersed recreation use would be lessened in the most scenic mountain ranges where fires would be controlled at a small to moderate size. Increased protection would be provided along the major tourist highways.

The impacts to recreation use in the areas proposed for fire management category B, covering most of the western portion of the District, would continue to be mixed in the short term, as both managed and uncontrolled wildfire occurs. Intermediate

to large fires would continue to have local negative impacts to recreation values associated with a loss of tree and shrub cover and scenic value.

In the short term, there would be a loss of local natural, undeveloped, and scenic recreation values due to increased management practices that burn or remove tree and shrub cover. In the long term, the effects on recreation resources would be beneficial as the potential for large, intensive fires is reduced and a diversity of landscape settings is maintained.

With increased prescribed burning and treatment in the areas proposed for fire management Category B, there is a potential for loss of primitive recreation values in the remote undeveloped areas of the Pine Nut Mountains outside of the Burbank Canyons Scenic Area and WSA, unless such treatments are designed to protect and maintain these values.

Realty Management. In the short term, potential damage to some realty authorized facilities would increase due to an increase in burned acreage. This would be concentrated in the Sierra Front area. Compared to the proposed action, this increase would be lower, but the change cannot be quantified with available data.

In the long term, as the potential for large, severe fires decreases, potential damage to

authorized facilities would decrease. Compared to the proposed action, this decrease would occur later in time, but the change cannot be quantified with available data.

Wilderness

Modified suppression techniques in the eastern units would result in slight impacts to naturalness where fires are constrained to smaller acreage than would occur under the proposed action. The eastern units would maintain their apparent natural qualities as most fires would burn to natural barriers and irregular patterns. The frequency of large, severe fires is not anticipated to be high in the eastern WSAs. The negative short-term impacts to solitude, primitive, and unconfined recreation and scenic values would be less than the proposed action.

Continued aggressive fire suppression in the western WSAs could impact naturalness through the creation of unnatural edges and by not allowing uneven-aged burn patterns to develop over time. In the short term, scenic values and opportunities for solitude and primitive and unconfined recreation would be maintained as a result of protecting existing vegetation. However with fuels buildup over time, it is more likely that a severe wildfire would occur and adversely impact scenic and wilderness values, compared to the proposed action.

That likelihood would be less, however, than under current management.

Cultural Resources and Native American Religious Concerns

In the western part of the District, over the short term, there may be more potential for inadvertent damage from fire suppression activities and/or fire management activities than under the proposed action. Cultural resources may be harmed from the direct effects of fire, through erosion, and through increased visibility. The use of prescribed fire is subject to standard operating procedures and laws protecting cultural resources and Native American concerns. No significant impacts from this type of activity is expected. In the long term, the reduction of severe fires would be beneficial to most cultural resources. Since management goals would be reached over a longer term than the proposed action, the potential of fire damage to cultural resources from severe fires also would occur over a longer time frame than under the proposed action.

The limited use of prescribed burning is not expected to produce any significant impacts, since this kind of activity is subject to standard operating procedures and laws protecting cultural resources and Native American concerns. Fire suppression or management activities may damage cultural resource sites. Direct effects of fire may

harm cultural resources. Larger acres burned may expose cultural resources to illegal collecting through increased visibility and risk of damage through erosion. Over the long term, management goals would be met which would limit the buildup of fuels, which should decrease the risk of severe fire. The reduction of the potential for severe fire would be beneficial to most cultural resources.

Visual Resources

In general, the few fires that occur in the eastern part of the District would be suppressed at an intermediate size and less total acreage, with an objective to maintain diverse and irregular visual patterns. The impacts to visual resources would be short term and local to specific drainages and hillsides. In the long term, the impacts to visual resources should be positive with irregular and medium sized burn patterns.

In the western part of the District, prescribed burning would become prevalent over the next 20 years in the more remote areas of the western mountain ranges. Impacts in the short term would be similar to the proposed action with less acreage burned in the remoter mountain ranges in the west. In the long term, visual impacts would be similar to the proposed action with more medium sized and diverse fire patterns.

Social Economic Conditions

In the short term, localized reductions in scenery-related real estate values and residential quality of life could occur from an increase in burned acreage. This would be concentrated in the Sierra Front area. Compared to the proposed action, these reduction would be lower, but the change cannot be quantified with available data.

Minority and low income families are not expected to be disproportionately affected by the proposed changes in fire management.

In the long term, as the potential for large severe fires decreases, potential reductions in scenery related real estate values and residential quality of life would decrease. Long-term improvements in recreation, wildlife, and other ecosystem-related values could result in improving the sustainability of development in the region, since many businesses are attracted to the region based on its quality of life. Compared to the proposed action, these improvements would occur later in time, but this change cannot be quantified with available data.

CONTINUE CURRENT MANAGEMENT ALTERNATIVE

Fire Frequency

Continued aggressive fire suppression would result in most fires reaching less than ten acres. The consequent buildup of fire hazard fuels would result in an increasingly high risk of severe fires, particularly in the western part of the District in the long term.

Water

For the short term, the impacts on water resources would be similar as discussed in the proposed action. However, the major difference is that in the long term, the adverse impacts would be more pronounced due to the possibility of large, severe fires.

Air Quality

Minimal changes in air quality are expected, since fires would continue to be aggressively suppressed, particularly in the western part of the District. In the long term, the air quality is expected to deteriorate due to more large, severe fires when compared to the proposed action. Pollutants like particulate matter, fugitive dust, and possibly carbon dioxide may then exceed state standards.

Soils

The risk of surface soil layer losses from large, severe wildfires would continue to be high in the western part of the District, primarily in the sagebrush/pinyon-juniper zone, due to increased fuel loading and cheatgrass infestation. Not only would the risk of surface soil loss continue at higher than the normal geologic rates, but soils in these areas also would be subjected to the risks of extremely high burn temperatures over large areas. These hot burns sterilize the surface soils of microflora and -fauna, destroy perennial-grass root crowns, create water-repellent runoff conditions, and also destroy seed reserves crucial to natural revegetation. These conditions also increase the risk of noxious weed or undesirable plant infestation, which prolongs site recovery time. Soils in the salt-desert shrub communities that burn only rarely would continue to be relatively unaffected by wildfire, and soils in the eastern part of the District in the sagebrush/pinyon-juniper zone would continue to be only slightly affected by fire in comparison to the west.

Vegetation

In the short term, vegetation communities would remain much as they are now. Very few fires would escape initial suppression, so primarily small, scarcely noticeable patches (less than 10 acres in size) of trees or brush would be converted to a grass/forb

community. The exception would be the periodic catastrophic stand-consuming fire which escapes fire control efforts and grows to several thousand acres with very few unburned patches within the fire boundary. Over the short term, the number of severe fires would be about the same under any of the alternatives.

In the long term, however, the severe fires would continue to occur at the same or an increased frequency. More large areas of grassland would be produced with fewer and smaller stands of trees remaining. These large fires always require efforts at restoring perennial vegetation through seeding, yet rehabilitation efforts can fail. With failure to establish perennials, the annual cheatgrass would become dominant on increased acres within the six- to ten-inch precipitation zones -- which includes more than half the District.

In the long term, the proportion of shrub/tree vegetation would diminish and the proportion of grass/forb vegetation would increase under all alternatives. The blocks of shrub/tree vegetation remaining, as well as the blocks of grass/forb vegetation created would be much larger with a lower variety of different vegetative communities within the blocks. In the short term, this alternative results in the largest number of acres growing trees and shrubs, while in the very long term, this alternative results in the fewest acres growing trees and shrubs, with

larger acreages converted in blocks to grass/forb vegetation through the action of severe, stand-destroying fires.

Because most of the vegetation treatments identified in the present land use plan for the Pine Nut Mountains have already been completed, forests there would not be further protected from threat of large, intense wildfires through fuels treatments in advance. Therefore the risk of loss of forest related values would be higher.

Without preventative fuels treatment to protect aspens, cottonwoods, pines, and riparian zones, from large, severe wildfires, the threat of loss would continue to increase. Loss of associate values would be inevitable, and recovery would take a long time.

Wildlife

Wildlife habitat would continue at risk for most species. Impacts of current management are a continuation of the *status quo* in the short term and an increased risk of severe, large fires in the long term.

Immediate responses to fire by various groups of species are summarized below.

Fauna such as fish (including the threatened Lahontan cutthroat trout) cannot escape and may be suffocated by aerial retardant dropped in streams, die from ashes falling in the streams, or be killed by high water

temperatures after the riparian shade trees have burned. The occurrence of this impact would be increased in the long term compared with the other two alternatives, because no preventative and protective fire hazard fuels treatments would be undertaken.

Severe burning of riparian areas, especially those with trees such as aspen or cottonwood not only displaces wildlife during the fire, but many species of birds, particularly cavity nesters such as kestrels and flickers, may not return at all, since they are attracted by the different structural diversity offered by riparian vegetation when compared with surrounding areas. Thus the effects in the long term would be negative.

The major effect on mule deer is destruction of the shrubs on which they depend for forage, as has been the case particularly in the Lassen-Washoe Interstate Deer Herd area north of Reno. Even without forage, the deer are not inclined by nature to move elsewhere -- they do not readily pioneer new areas. Starvation results. The key consideration for mule deer is size of the fire: fires that are too small have little benefit; fires too large have the negative effects of eliminating edge effect or patchiness. This impact would be greater in the long term than compared to the other alternatives.

During the 1950s and 1960s, the Pine Nut Mountains provided some of the best places to hunt mule deer in Nevada. With the continuation of early suppression of fires since then, and the encroachment of pinyon-juniper into sagebrush vegetation zones, forage for deer has been severely reduced, and deer numbers have subsequently declined. While pinyon-juniper serves as good thermal cover for mule deer, the animals generally use just the edges of it, avoiding thick stands without any shrub understory. Continuation of current management would continue to aggravate this condition, not only in the Pine Nuts but elsewhere. The overall effect of full suppression in the long term would be negative.

One advantage of large fires for some game species is that the vegetative succession is set back, and grasses and forbs and a few shrubs are usually the first species to become reestablished. Large mammals such as antelope and bighorn sheep, and to a lesser extent, deer, readily use these areas for foraging. The current policy of attempting total suppression is not beneficial for enhancing feeding areas for large wildlife species. The overall effect of full suppression is long-term-negative.

Wild Horses, Wild Burros, and Habitat

In the short term, because of fire suppression, not many horse herds are likely

to be affected by fire. For those herds which have a large wildfire burn in or near the herd area, the impacts would be the same as under the proposed action with very short term risks but rapid benefits from increased forage. In the long run, however, severe fires could eventually burn large areas somewhere in all the horse herd areas, although the chances of large fire in the Marietta burro range are very small. As large areas are converted from shrub/tree vegetation to grass vegetation the herds benefit from the increased forage base and from the decreased cover for the mountain lions, which are the only significant horse predator. This alternative, with the largest amount of widespread wildfire in the long term, provides the horse herds with the smallest short term benefits but with the greatest long-term benefits of any of the alternatives.

Land Uses

Livestock grazing. This alternative creates occasional short-term challenges to livestock operators, followed by long-term benefits. Whenever a large wildfire burns in a grazing allotment, the chance of the entire allotment needing to be closed to facilitate fire rehabilitation is much greater than would be the case with a small burn. But following the establishment of grass vegetation on the burned area, the forage base of the burned area is greatly increased and the larger the burn the greater the increase of forage

within the allotment. This alternative, with more large burns and fewer small burns places short term risks on the livestock operator but provides greater long-term benefits through increased forage than the other alternatives.

Forest Resources. Harvest of forest resources through treatment-related tree cutting would be limited, because many of the treatments approved in the existing land use plans have already been completed. In the long-term, and compared to the other alternatives, more acreage of forest resources would be removed from production under current management which does not provide for protection from threat of loss to large, severe fires. Once destroyed, the forest would take a long time to return to a productive state. This alternative would result in the least healthy, least diverse, and least stable conditions for all tree species.

Recreation and Tourism. Temporary impacts to dispersed recreation use are anticipated in the eastern portion of the District over the next 20 years. Fires are anticipated to continue to be infrequent but larger in size and total acreage in the most scenic and rugged mountain ranges that include the wilderness study areas. There is a high chance that a fire would burn stream drainages or pinyon-covered hillsides, resulting in a loss of tree cover, scenic value, and fishing quality. These impacts would be temporary, and would displace a

small number of recreationists to other similar sites in the region. Significant impacts are not anticipated at sparsely vegetated eastern recreation sites such as Grimes Point, Sand Mountain, Wilson Canyon, and Walker Lake.

The impacts to recreation values in the western side of the District would continue to be mixed. In the short term, aggressive suppression tactics would continue to have local positive benefits by holding most fires near residential areas to minimal acreage. Due to a build up of fuels however, large, severe fires are likely to occur in both the short and long terms -- regardless of suppression tactics. Intermediate to large severe fires near human population areas would continue to cause adverse recreation impacts as plant cover is removed and some use is displaced. In general, beneficial short-term local effects would result from maximum suppression efforts in the western part of the District, but both short-term and long-term negative impacts are anticipated as the risk of large, severe fire continue to increase.

Aggressive use of dozers and fire suppression tactics would exert both beneficial and adverse impacts to recreation use. These tactics create new off-road vehicle trails that are difficult to rehabilitate. Off-road vehicle opportunities would be enhanced at a further loss of undeveloped primitive, nonmotorized recreation

opportunities. Negative impacts to cultural education values in the Virginia City Historic District could occur with the establishment of new roads and trails or damage to existing historic routes, through the use of dozers and heavy equipment for fire suppression.

Realty Management. The potential for damage to some realty authorized facilities would continue and would intensify as the potential for large, severe fires increases. Large severe fires pose a greater risk for causing property damage to authorized facilities due to their increased heat which could overcome measures taken to make facilities fire resistant.

Wilderness

Few small to large size are anticipated in the eastern WSAs over the next twenty years. In the past, fire suppression techniques have impacted naturalness, both as a result of the methods of suppression employed and the fact that fires have not been allowed to create more diverse, uneven-aged vegetative patterns. Impacts to opportunities for solitude, primitive and unconfined recreation, and scenic values have been minimal.

Impacts to wilderness values in the eastern units as a result of fire suppression techniques would be largely eliminated, and apparent naturalness would be maintained in

most cases by allowing uneven, more natural burn patterns to occur. The eastern units are diverse in vegetation and topography, and severe burning throughout a unit is not anticipated. There is a possibility of a larger fire removing most of the vegetation across more than one drainage or hillside. Short-term negative impacts to opportunities for solitude, primitive and unconfined recreation, and scenic supplemental values could occur due to loss of vegetation, but in the long term the area would recover. It is not expected that nonnative species would make significant inroads in the eastern areas.

Some special values would be lost to fire, compared to the other two alternatives, because actions would not be taken to protect riparian areas or other localized resources at risk due to high hazard fuel accumulations.

In the western WSAs, the potential for a large fire is considerably greater. Such fires could remove most of the vegetation in the small western units, and impacts to apparent naturalness would be substantial in the short term. Due to their proximity to areas of human habitation, fires in the Burbank Canyons WSA would continue to be subject to full suppression techniques closer to residences. Such continued techniques would impact naturalness through the creation of unnatural edges and by not allowing uneven-aged burn patterns to develop over time. In the short term, scenic

values and opportunities for solitude and primitive and unconfined recreation would be maintained as a result of protecting existing vegetation. However with fuels buildup over time, it is more likely that a severe unplanned wildfire would occur, thus negatively impacting most wilderness resource values and providing an opportunity for nonnative vegetative species to be introduced.

Cultural Resources and Native American Religious Concerns

Due to the ongoing buildup of fuels, there is an increased risk of large, intense fires which may damage cultural resource sites in the western part of the District. Larger, more intense fires increase the potential for erosion, the visibility of cultural resources, and their exposure to illegal collection. The potential for inadvertent damage from fire fighting activities would continue. There is also the risk of destruction of large areas of pinyon or other resources important to Native Americans from larger, more intense fires.

In the eastern part of the District, there is less potential for severe fires than in the western part. The current management approach poses a risk to cultural resources from inadvertent damage from fire fighting activities, although these fires occur so infrequently that actual instances of damage may be relatively rare. In the very long

term, fuel may build up to produce fires similar to those of the west and cause the same adverse impacts to cultural resources.

Visual Resources

In the past, a low number of small to medium fires have occurred in the eastern part of the District where high scenic values are found in the major mountain ranges. Fire suppression techniques have impacted visual quality on a small scale, where fires were not allowed to create more diverse and irregular vegetative patterns. Overall there has been little impact to scenic values due to infrequent fires of small size. In the next 20 years infrequent but larger fires are anticipated in the most scenic eastern mountain ranges as fires are allowed to burn to a larger size. Temporary negative visual impacts may occur in the most scenic mountain areas as vegetation is removed.

In the western part of the District, strong visual impacts from fires and suppression would continue to occur. Sharp visual edges would continue to be created, particularly in fires that occur in the pinyon type and where dozers are used for suppression. Larger, more severe fires would continue to have a short term negative impact on visual quality, particularly in Alpine County and near the urban areas where complete mountain sides and drainages are burned. In the long term, an unnatural pattern of small distinct fires and larger severe fires would result. Most

fires would be kept small near the urban areas. Impacts from full suppression would be viewed as very positive at the local level by the public who live adjacent to fires that are suppressed at a small size. Even many whose homes have been burned would continue to oppose preventative fuels treatments near the homes they rebuild.

Social Economic Conditions

The potential for localized reductions in scenery-related real estate values and residential quality of life would continue and could intensify as the potential for large severe fires increases in the long term.

Minority and low income families are not expected to be disproportionately affected by continuing current fire management.

POTENTIAL MITIGATING MEASURES

LIVESTOCK GRAZING

Several actions can be helpful in reducing the adverse impact. Changing the grazing season in the area from a time when plants are growing to a time when plants are dormant can be a useful technique: the dormant plants are not greatly affected by grazing, and the livestock trampling on the burned area can be an effective way of planting seeds into ground which has been scorched bare by intense fire. Temporary electric fencing is also quite useful for controlling access to burned areas without closing an entire pasture to grazing. In some cases, an alternative area can be found for the livestock to graze for the two or three years in which grazing patterns are usually changed for fire rehabilitation purposes. The BLM range specialist and the permittee may use any or all of these techniques following burning to help the burned area recover from the short-term effects of the fire.

CONSULTATION AND COORDINATION

Public scoping for this plan amendment was initiated with the publication of a Federal Register Notice of Intent (Vol. 62, No. 67 pg. 16869, April 8, 1997). Press releases were published in northern Nevada newspapers. With this notification, a scoping letter was sent to about 50 individuals and organizations. Nine comments were received during the 30 day scoping period. These comments generally supported the re-integration of fire as a natural component of the ecosystem and the use of prescribed/managed fire to reduce the accumulation of fuels. However, caution was urged to prevent the spread of noxious weeds and catastrophic impacts to public land resources.

On-going consultation with Native Americans has occurred throughout this planning effort in conformance to the Native American Graves Protection and Repatriation Act, American Indian Religious Freedom Act and the Environmental Justice Executive Order.

LIST OF PREPARERS

<p style="text-align: center;">Table 2 Qualifications of Preparers/Reviewers</p>			
Name	Responsibility	Education	Experience
Rosemary Thomas	Co-Project Manager/ Fire Mgmt.	B.S. Animal Science	17 years
David Loomis	Co-Project Manager / Planning/ NEPA/ Social Economics	M.S. Land Use Planning B.A. Economics	19 years
M. Bashir Sulahria	Water Resources / Air Quality	Ph. D. Hydrology M.S. Watershed	25 years
Tom Abbett	Recreation/ Visual/ Wilderness	B.A. Forestry /Recreation	26 years
Rick Brigham	Wildlife	B.S. Wildlife Mgmt.	29 years
Peggy Waski	Cultural Resources and Native American Religious Concerns	B.A. Anthropology	13 years
Steep Weiss	Forestry	M.S. Resource Mgmt. B.S. Resource Cons.	24 years
Earl McKinney	Vegetation/ Livestock/ Wild Horses & Burros	B.S. Range Mgmt.	23 years
Jim DeLaurel	Soils	B.S. Agronomy	19 years
Charles Kihm	Realty Management	M.A. Public Admin. B.S. Natural Resources	20 years

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(These references are available for review at the Carson City Field Office, 5665 Morgan Mill Road, Carson City, NV)

DRAFT FINDING OF NO SIGNIFICANT IMPACT

As outlined in the attached environmental assessment, the objective of the Proposed Fire Management Site Plan Amendment is to restore fire as an integral part of ecosystems, improve the diversity of vegetation, and to reduce fire hazard fuels. The proposal includes changes in the management of fire on public lands in the Carson City District. The changes include increasing the use of prescribed fire and tree thinning and allowing more wildfires to burn out naturally. This would be accomplished through assigning fire management categories to all of the public lands in the District. Each category includes specific direction for wildfire suppression and prescribed burning/fuel reduction. The overriding goal of the fire management program would remain protection of life and property.

Implementation of these measures would result in a decreased potential for future adverse environmental impact. Specifically, increased use of prescribed fire and tree thinning would reduce the potential for severe fire. Allowing more wildfires to burn out naturally would help to restore fire as an integral part of the ecosystem. Consequently, the proposed amendment would have no significant impact.

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